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ON THE CHANGE OF COLOUR IN BIRDS,

THROUGH AND IRRESPECTIVE OF MOULTING.

From the Swedish of W. Meves.[*]

TRANSLATED BY H. E. DRESSER, F.Z.S.

IN a communication to the naturalists assembled at Altenburg on the 6th July, 1862,[†] Professor H. Schlegel originated a lively discussion on this subject amongst the ornithologists of Germany, during which many different opinions were expressed, and the essays thereon which have since appeared[‡] have already attained considerable magnitude. It is, however, really on the theories started by Schlegel respecting "Das Entstchen des voll kommenen Kleides der Vögel durch *Verfärben* und *Wachsen* der Federn unabhängig von der Mauser," that opinions are divided. I may therefore be permitted to show the result of some researches with which I have been employed for several years, but which must only be looked on as a commencement in a rich field of labour, and which I should scarcely have dared to make known had not another Swede, M. T. Hammargren, lately contributed a paper to the 'Kongl. Acadamien' in which the results arrived at do not agree with my own.

Before proceeding to the subject in question, it may be well to give a short review of the chief circumstances attending the moulting of some of our birds.

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[*] Öfv. K. Vet. Ak. Förh., 1854, No. 8.

[†] 'Naumannia,' i., Heft ii., pp. 19—40.

[‡] In the 'Journal für Ornithologie.'

I. *Single and complete Moult in Autumn.*—This takes place in all birds towards the autumn, when both the large wing- and tail-quills, as also the small feathers, are cast and replaced by new ones. Here belong:—

Loxia
Fringilla
Emberiza
Alauda
Sturnus
Turdus
Oriolus
Saxicola œnanthe
Sylvia philomela
,, luscinia
Ruticilla phœnicurus
,, tithys
Erythacus rubecula
Sylvia atricapilla
,, hortensis
Phylloscopus trochilus
,, abietina
,, sibilatrix
,, hypolais
Acrocephalus arundinaceus
Cinclus
Troglodytes
Accentor
Hirundo
Muscicapa grisola
Lanius
Ampelis garrulus
Corvus
Pica
Caryocatactes
Garrulus
Parus
Regulus
Sitta
Certhia
Picus
Junx
Cuculus
Alcedo
Coracias
Upupa
Columba
Caprimulgus
Cypselus
Strix
Falco
Tetrao urogallus
Coturnix (?)
Otis
Grus
Fulica
Gallinula
Rallus
Scolopax
Numenius
Recurvirostra
Ciconia
Ardea
Cygnus
Anser
Anas tadorna
Dysporus sula, and others.

As exceptions here are the larger birds of prey, which do not change their feathers with any degree of regularity, but generally cast them at longer or shorter intervals.

II. *Double or Spring Moult* takes place towards the spring, and extends when—

A. *Entire,* to all or most of the small feathers, and in some cases also to the two middle tail- and three inner wing-quills, as, for instance with—

Anthus
Motacilla
Saxicola rubetra
Sylvia cinerea
Muscicapa collaris
„ atricapilla
Tringa
Phalaropus
Totanus
Limosa
Strepsilas
Hæmatopus
Charadrius
Anas glacialis
Sterna
Larus
Lestris
Procellaria
Colymbus
Uria
Mormon
Alca

B. *Partial,* affecting only some of the feathers of the head and neck, as with *Sylvia suecica, Emberiza nivalis* and *lapponica, Vanellus cristatus,* and also with a large number of the younger males (particularly of Linné's *Passeres*), the first spring after the year of their birth.

III. *Summer Moult.*—Takes place after the pairing season, and is—

A. *Entire;* in which case all the small feathers are changed, and in some cases (e. g. *Anas boschas*) the four middle tail- and five or six inner wing-quills. The males then adopt a plumage which more or less resembles that of the female; as in the Ducks (excepting *tadorna* and *glacialis*); thus *Anas boschas, acuta, penelope, clypeata, querquedula, crecca, Fuligula cristata, ferina, clangula, mollissima,** *Mergus,* and others.

B. *Partial;* in which case the head and neck feathers are exchanged for short, narrow and soft feathers, which almost resemble the immature plumage of the bird; and this occurs in *Perdix cinerea*,[*] *Tetrao bonasia* (in which the summer feathers are generally like down on the points of the new growing autumn feathers), *tetrix* and *urogalloides*.[†]

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* The Eider-drake undergoes, from the middle of June till the commencement of October, an almost uninterrupted change of plumage, at least on the breast; for the reddish breast-feathers are at first succeeded by almost pure brown ones; then similar ones with more or less white in the centre; then reddish ones with a black border; and, lastly, the reddish winter feathers again. Drakes shot in September often show three sorts of these feathers, of which two certainly have blood-quills. No bird therefore affords better opportunities than this for a study of the change of colour by a real moult.

IV. *Triple Moult*, or a conjunction of the spring, summer and autumn moults.

A. *Entire;* including almost all the small feathers, as in *Lagopus alpina* and *subalpina;* although during the summer an almost continuous moult takes place with these birds, three distinct plumages may still be plainly observed, *viz.* the darker spring, the lighter summer (or, more properly, the autumn dress, as it is not donned until September), and the white winter dress.

B. *Partial*, embraces the small feathers of the head, neck and under parts. The nuptial dress begins to show itself towards the spring, and is complete about the end of April, and is cast again about the beginning of July. This occurs with *Podiceps auritus*, Linn. (*Podiceps cornutus*, auct.), which becomes, in its summer plumage, *Podiceps arcticus*, auct., and also with *Graculus carbo* and *cristatus*. The former of the two last-named has, in November, on its head quite short blackish-blue feathers, and on its neck grey-brown feathers with a slight blue tinge. From this dress it passes, by change of feathers during the winter, by degrees to the nuptial dress.

Whether the other Grebes assume a particular summer plumage I have not myself had an opportunity of observing, but the subject is worthy of careful investigation.

Besides these changes of plumage caused by the old feathers being entirely cast and fresh ones growing, many birds, especially such as have only a single moult (but also some that moult several times), undergo a very visible change of colour towards the spring; namely, by losing certain portions of their feathers, which operation is here commonly termed "brämfällning," or

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[*] W. von Wright, 'Götheb. K. V. S. Handl. 1850,' p. 78.

[†] *Tetrao urogalloides*, therefore, inherits this from its father, the Blackcock, as this summer plumage does not seem to occur so far as the Capercaillie is concerned.

"border-casting."[*] This has been observed and explained in various ways.

With the assistance of some sketches I have made, I will now endeavour to answer the chief question—Whether the colouring matter in certain feathers is found there *ab initio*, or is evolved there during the spring or pairing season?

According to the phraseology employed by Nitzsch, a feather consists of the stem (*scapus*), the branches (*rami*), and the plumules (*radii*). From the stem, branches proceed on either side, and from these again plumules; but these last named are not always on the sides, but sometimes on the top of the branches. The small ciliæ and hamuli which are fastened on the radii, and whose province it is to hold these together, are here passed over, as they have nothing to do with the change of colour.[†]

If we examine the feathers of different birds with the "winter border" under the microscope, we find that behind the white, dark, or colourless outermost points, the colouring matter in some is found in the radii, in others in the rami. Thus there are two forms which may be called, according to their subsequent changes, "plain point casting" and "point and radii casting."

1. *Point casting* takes place in those birds which have the colouring matter usually in the radii. The colourless or coloured points commence, after the autumn moult, to fall off by degrees; but this casting off is not completed until towards the spring, or much later, and then the hitherto concealed colour shows itself in its full beauty.

PLATE I., fig. 1 shows the upper portion of a black throat-feather, in autumn, with its white points, of a male Redstart, *Ruticilla phœnicurus:* fig. 2, a similar feather in the spring. The points are cast even with the coloured portion. To this group belong *Fringilla montifringilla, domestica, montana, cœlebs, chloris, spinus, Emberizæ, Alaudæ, Sturnus, Turdus* (*T. torquatus*), *Parus, Saxicola œnanthe, Sylvia tithys, suecica* (the reddish brown and black feathers on the breast), many birds that have a partial moult, and particularly young birds, belonging to this group, after their first winter.

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[*] That other causes than this may effect a change in colour in some few Swedish birds, as *Coracias garrula, Lanius collurio,* and others might be a subject for enquiry on some future occasion.

[†] See Prof. Sundevall's work on the wings of birds (Vet. Ak. Handl. 1843).

2. *Point with radii casting* takes place with such species as have the colouring matter in the rami of their feathers. Here not only the points are cast, but also the colourless radii, with whose points the rami are to some extent covered, and thus their colour appears faint. Naturally the points disappear first, and if we examine such a feather towards the spring we observe at first the plain point casting, and although the colours by that time have become much clearer, we see upon them nevertheless a sort of hoar (*pruina*), which disappears, however, in proportion as the radii-casting extends downwards. The colour does not show itself in its full lustre until the coloured portion of the rami is entirely free from radii.

The feather is now not only much shorter, but also narrower, inasmuch as the radii do not now hinder the rami from approaching each other. Fig. 3 shows a breast-feather in the autumn of the Common Redpoll, *Linota linaria*, male; fig. 4 a centre-piece of a branch from the same feather, much magnified in order to show that the points of the radii overlap the nearest rami; and fig. 5 a breast-feather of the same species in July, when the bird is in full summer plumage.

In some feathers the radii are of very short duration—*e.g.* the red under tail-feathers of the Greater Spotted Woodpecker, *Picus major*. While growing these are covered closely with fine thin radii, so that they look as if strewn with powder; but the feather has scarcely attained its full length when the radii-casting commences. Fig. 6 represents a portion of such a feather in October. The outer points, which were already free from radii, are not drawn. Similarly the red or yellow feathers on the heads of the Woodpeckers are *ab initio* without these covering radii, and therefore directly on appearing they have their intense colour. Fig. 7 shows such a new feather of the Great Black Woodpecker, *Picus martius*.

To this group belong, further, *Fringilla cannabina*, *erythrina* and *flavirostris; Loxia pityopsittacus*, *curvirostra* and *bifasciata; Corythus enucleator; Sylvia suecica* (the blue feathers); all Woodpeckers with the above-mentioned feathers; *Anas boschas*, *clypeata* and *tadorna; Podiceps auritus* (the brown and reddish-brown feathers of the under parts), and some others.

In order to illustrate the very different forms of the radii in various birds, and more especially the very different structure of the feathers in the winter and summer plumage of some birds which undergo a double moult, I give here, in addition, some drawings of the feathers of foreign birds, which I think will sufficiently refute the views of Schlegel and others on the change of feathers without moulting, or the possibility of one form growing out of another.

PLATE II., fig. 8, represents two branches of a breast-feather of the beautiful *Nectarinia senegalensis*, a male, in nuptial plumage. The red tips have *ab initio* no radii, nor are the blue radii lower down cast. These latter differ materially from, for instance, the radii of *Linota linaria* (fig. 4), inasmuch as they are fastened, not on the sides, but on the top of the branches. This may be clearly observed in fig. 9, a branch seen from the under side. The form of the winter plumage probably agrees with fig. 10, which is a portion of a breast-feather of *Nectarinia formosa*, a male, in winter plumage. Fig. 11 is a portion of a similar feather in nuptial plumage, taken from the same specimen in a state of transition to this plumage.

Fig. 12 is a portion of a breast-feather from the middle of the breast of a male *Ploceus rubritorquis* in winter plumage. Fig. 13 is an orange-red branch from the nuptial plumage of the same species, and from the same locality. This bird, as also *Ploceus longicauda*, *axillaris*, *albonotatus*, *capensis*, and others, in addition to all the small feathers, changes the tail-quills twice a year.

Fig. 14 is a portion of a green head-feather from *Anas boschas*, in the spring. After the autumn moult the square-pointed radii are furnished with small colourless points, which, however, soon fall off. The structure of the head-feathers of *Anas clypeata* bear much resemblance to this species, but the colour of the branches is not brownish, but white. Fig. 15 is a branch of a feather from the summer plumage of the same species, and from the same locality.

The radii of the species represented in figs. 8 to 15 undergo naturally, also, a natural abrasion or wearing away; but this does not occasion a brighter tint of colour, being in reality a decay.

In such specimens as are in a state of transition from one stage of plumage to another, we may, if other signs are wanting, easily discover, with the aid of the microscope, which feathers are new, for the old ones always show signs of wear.

Fig. 16 is a green feather-branch from the breast of a male *Trochilus rubineus.* The outer colourless radii, which form the winter plumage, have all nearly fallen off; the point of the branch probably remains until the next moult.

Amongst those birds in which plain point-casting takes place should be included *Cuculus cupreus.* Fig. 17 shows a feather branch from the breast of a male of this species. The radii points turned upon the left side have much to do with the unusual golden lustre of the feather.

Fig. 18 is a branch of the lance-shaped copper-red neck-feathers of the male *Lophophorus impeyanus.* The radii on one side only of the branches are metallic, for those on the other side lie concealed under them. A similar formation is found in the green throat-feathers of *Paradisea apoda* and in *Epimachus regius* and *magnificus* in their blue-green neck- and head-feathers. On the other hand, the velvety breast-feathers of *E. regius* show on the coloured side a very different formation of the radii. Here the radii may be compared to a row of arrow-heads stuck into each other, and having the barbs standing upwards.

Resemblance in the form of the radii does not show that species possessing similarly formed radii are closely akin, but has probably an important bearing on the feather's lustre, changes, &c.

Fig. 19 is a piece of a blue feather-branch from the breast of *Pavo cristatus.*

Fig. 20 is a piece of a brown feather-branch from the breast of *Anas boschas* in the spring. The radii are cast from the point of the branch, which is not drawn. In the autumn the breast-feathers have besides small white borders. The remaining radii are twisted one turn. This peculiarity I have noticed in many ducks. On the left side are two radii with hooks (*hamuli*), in order to fasten the radii to each other. Such are found to be especially numerous in the water-fowl.

Fig. 21 represents a portion of a reddish-brown breast-feather of *Podiceps auritus.* Here the radii are twisted two turns;

perhaps this assists in some way to keep the water from the body.

In conclusion, it is perhaps scarcely necessary to add that all that has been here stated respecting the details of moult is best shown in old male birds, and very often cannot be relied on so far as the females are concerned.

EXPLANATION OF THE PLATES.

PLATE I.

Fig. 1. *Ruticilla phœnicurus*, autumn.
„ 2. The same, in spring.
„ 3. *Linota linaria*, autumn.
„ 4. The same, much magnified.
Fig. 5. The same, in July; full summer plumage.
„ 6. *Picus major*, in October.
„ 7. *Picus martius*.

PLATE II.

Fig. 8. *Nectarinia senegalensis*, male, in summer.
„ 9. The same, under side.
„ 10. *Nectarinia formosa*, winter.
„ 11. The same, nuptial plumage.
„ 12. *Ploceus rubritorquis*, winter.
„ 13. The same, nuptial plumage.
„ 14. *Anas boschas*, male, in spring.
Fig. 15. The same, in summer.
„ 16. *Trochilus rubineus*, male.
„ 17. *Cuculus cupreus*, male.
„ 18. *Lophophorus impeyanus*, male.
„ 19. *Pavo cristatus*, male.
„ 20. *Anas boschas*, spring.
„ 21. *Podiceps auritus*.

NOTES FROM AN ARCTIC JOURNAL.

By H. W. FEILDEN, F.G.S., C.M.Z.S.

(Continued from p. 58.)

In spite of the extremely low temperature which we experienced during the month of March, the rapidly lengthening daylight gave us opportunities of increasing the extent of our walks, and exploring the neighbourhood of our winter-quarters. Every cliff, ravine, water-course, or locality where the snow did not lie was carefully examined. For miles around us the strata were composed of hard limestones, slates, grits and schists, evidently belonging to a remote geological period. The strata were generally vertical, or else dipping at very high angles. To this series of ancient rocks has been given the name of "Cape-Rawson Beds,"* although they appear to represent in time the Huronian epoch of North America. Though it was somewhat disappointing to find the vicinity of Floeberg Beach composed of metamorphic rocks showing no traces of organic remains, as it deprived us of the possibility of forming an extensive collection of fossils, yet there was much of interest to be observed in the neighbourhood. Recent beds composed of thick deposits of mud, silt, and water-worn gravels were discovered in various localities, and traced to an elevation of nearly a thousand feet. The organic remains found in these beds proved to be identical in every respect with the fauna now existing in Grinnell Land. We discovered in them the bones of the Lemming, Ringed Seal, Reindeer, and Musk-ox, and the shells of the marine Mollusca which are most abundant in the adjacent sea.† This is conclusive evidence that during the lapse of time, indicating an upheaval of Grinnell Land to a height of a thousand feet, there has been little or no change in the existing climate. Not the least interesting discovery was finding drift-wood lying on the surface of the ground, at different elevations up to three hundred or four hundred feet, still retaining its buoyancy, and differing little in appearance from that now being stranded on the shores of the Polar Sea. Whilst granting full effect to the preservative qualities of extreme cold, yet it seemed almost incredible that a substance like wood could remain intact whilst lying on the surface during a period of time requisite to elevate a continent a height of several hundred feet. It was satisfactory, therefore, to observe that, when found inland, this drift-wood was always discovered in situations where it had undoubtedly been uncovered from the glacio-marine beds of the district, by sub-aërial

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* 'Quarterly Journal Geological Society,' August, 1878.

† The following species of marine Mollusca have been identified from the Post-tertiary beds of Grinnell Land:—

Pecten grœnlandicus
Leda pernula
,, frigida
,, arctica
Arca glacialis
Axinus flexuosus
Astarte borealis
,, fabula

Neæra subtorta
Saxicava rugosa
Mya truncata
Cardium islandicum
Tellina calcaria
Thracia obliqua
Siphodentalium vitreum
Trochus umbilicalis

Buccinum tenue
,, hydrophanum
Trichotropis borealis
Trophon clathratus
Pleurotoma tenuicostata
,, exarata
,, Trevelyana
Cylichna alba

denudation. The mud-beds in which the drift-wood had been originally imbedded preserved the Mollusca so effectually that, at an elevation of two hundred feet, I found the hinge-ligaments and syphons of *Mya truncata* attached to the shells, pieces of *Laminaria* which emitted the peculiar odour of sea-weed when dug out, and feathers of birds very little decayed.

A series of thirteen samples of this drift-wood was submitted to Dr. R. M'Nab for examination. Eleven proved to be coniferous, and two dicotyledons, both belonging to the same genus *Populus* and to the same species. The eleven coniferous woods represented species of *Abies*, *Larix* or *Picea*, and *Taxus*, the commonest form being some species of *Picea*. Dr. M'Nab was not able to identify the species, but from a careful comparison of specimens is inclined to think them North American, and, as the annual rings are usually very well developed, the trees must have grown in the more temperate northern latitudes. Drift-wood was found by our Arctic explorers of the Franklin Search Expeditions in Melville Island and other parts of the Parry Archipelago, under precisely the same circumstances as we found it in Grinnell Land. Those observers, not being well acquainted with geological effects, came too hastily to the conclusion that the wood had grown *in situ*. This error has been accepted in later days by more than one eminent geologist, and has been adduced as a proof of a mild climate having prevailed within comparatively recent times in the Polar Regions.

Among other interesting observations was the action of the heavy pack-ice when driven on shore by gales, or by the pressure of the ice from seaward. Some of the enormous masses, forty to fifty feet in thickness, were pushed on to the land, driving the gravel and earth before them in the shape of long mounds. On some of these ridges I discovered rounded pebbles, as unmistakably ice-scratched as those which we find in our Scotch and English boulder-clays. From the position in which I found them—namely, on the surface of the sides or slope on which the grounded hummocks had rested—I could not doubt that they had fallen from the bottom of the stranded floebergs when they dissolved in summer. Some of these floebergs had likewise been turned completely over during the turmoil of the elements, and their exposed surfaces were grooved and fluted in an analogous manner to that which we observe with rocks in glaciated districts.

Partially imbedded in these floebergs were fragments of rock or pebbles, with mud undoubtedly derived from contact with the sea-bottom; not unfrequently these pebbles were ice-scratched. It would be difficult to imagine how these scratchings could be produced, crossing one another over the surface of the same pebble, if we had to rely on only one form of movement of the floeberg when in contact with the bottom—namely, a direct on-shore pressure. A phenomenon which I frequently observed may, however, easily account for these ice-scratchings. At the periods of high-tides, as the tidal wave flowed in with extra force, the whole body of the young or season's ice, approaching six feet in thickness, was affected; it rose and fell under one's feet with peculiar throbs or pulsations. This sheet of young ice, by which the large hummocks were surrounded, unquestionably acted as a raft, raising the huge masses from the ground, and then as the tidal flow receded, permitting them again to grind against the bottom. A convincing proof of this up and down movement of the ice-raft was given in the case of the largest floebergs, which being too deeply imbedded in the bottom refused to move. Around them the season's ice could not resist the pressure of the tidal in-flow, but split with a loud report, the water rising from below through these cracks, and flooding the ice which adhered to these immovable masses.

On the 11th March the quartermaster on watch observed three white birds fly past the ship in a northerly direction, and two or three days afterwards the tracks of Ptarmigan were observed in the snow, near to spots where the snow covering had been removed by the force of the wind. On the 16th I found a Ptarmigan's feather close to a plant of *Potentilla*, which the bird had been scratching at. This early appearance of these birds in Grinnell Land during the coldest month of the Arctic year seems remarkable, and raises the question in my mind whether some of them do not winter by choice in those inhospitable regions, within four hundred and fifty miles of the North Pole. I do not think that it can be doubted that *Lagopus hemileucurus* is a permanent resident in Spitsbergen, and the same may hold good with *L. rupestris* in Grinnell Land. If so, the genus *Lagopus* contains the only species of birds that can exist throughout the year in the Polar zone.

The entries in my journal for the month of March consist almost entirely of accounts of walks taken in the neighbourhood of Floeberg Beach, and references to the geological structure of the district. On the 23rd, in company with Captain Nares and Lieutenant May, I ascended a hill some five miles inland, which rises to a height of 1400 feet above the sea. Where uncovered, the sides of this hill showed slopes of broken slates, looking like the *débris* thrown out from a slate quarry. Mixed with the fragments of slate were numerous pieces of yellow quartz, prettily crystallized, which had originally run in veins through the slate-rock. From an elevation of 800 feet lichen-growth became more plentiful, and luxuriant; several of the larger species, which were not to be found at the sea-level, covered all the exposed stones and rocks. This observation on the increase of lichen-growth at considerable altitudes in Grinnell Land was corroborated by me in the future; and it is deserving of notice, that an elevation of 1200 to 1400 feet in Grinnell Land seems to be most conducive to the growth of these plants. The lower ranges of hills and headlands, which were chiefly accessible to us in Grinnell Land, rose as a rule to the altitudes above mentioned, and were of course greatly exposed to the violent winds. In consequence, those areas are more frequently bared of snow throughout the year, even in winter, than the lower levels, where the snow drifts and only disappears for a short time in summer under the influence of the sun's rays. Again, on the higher mountains of 5000 feet altitude (none of which I ascended) the region of perpetual snow appeared to have been reached, and probably there would be a less area available for the dispersion of lichens. In other words, we found the maximum of lichen-growth at the altitudes where the snow lay with least persistency.

On the extreme summit of the hill which we ascended on the 23rd, and which was named "The Dean," I found the characteristic erratic boulders of the lower land, in the shape of rounded blocks of gneiss and dark chocolate coloured conglomerates—indeed, these proofs of submergence were found by me at the highest altitudes I reached in Grinnell Land.

On the 29th March a Snowy Owl was seen by Lieut. Parr lazily flapping over the lowlands near the sea shore, a lapse of five months having intervened between the latest appearance of this species in autumn and its return in the ensuing year.

On the 1st April the fresh tracks of a small party of Musk-oxen were discovered in the vicinity of winter-quarters. Though our most eager sportsmen went in pursuit, no one was successful in meeting with them. The tracks of the animals showed that they had been moving from the north-west, probably from some of the sheltered valleys about Cape Joseph Henry. A pack of Wolves had followed these Musk-oxen, and from traces that I examined it was evident that they had been able to secure at least one of them, the droppings of the Wolves being largely composed of the wool and hair of the Musk-ox. The most extraordinary circumstance in connection with the life-history of the Musk-ox is its capability of finding subsistence in Grinnell Land during the long Arctic night. We may dismiss from our consideration the question of a southern migration, for there is no land within the possibility of reach of these animals where the winter conditions would be appreciably modified, whilst we know for certain that the Musk-oxen living in the extreme north of Greenland never pass to the south of the great Humboldt Glacier. The extraordinary powers that these animals must possess of resisting cold does not excite my astonishment so much as their capability of procuring food during the long night. Even in those months during which the sun remains above the horizon for the whole twenty-four hours, it is a matter of wonder how such large animals can obtain not only subsistence, but accumulate large quantities of fat; but during the five months that the sun remains below the horizon, and every scrap of food must be searched for beneath a deep snow covering, the difficulty of existence must be greatly increased. No animal represents more fully than the Musk-ox the truth of the doctrine of the "survival of the fittest." The oldest, perhaps, of existing mammals, it has found for itself in the Arctic and Polar Regions an almost impregnable retreat from the assaults of man, so destructive to the large Mammalia in all other portions of the globe. Unaffected by the rigours of the Arctic winter, and finding subsistence on the sparse vegetation of those utterly dreary regions, the species will doubtless survive long after the Elephant, Bison, and many other large quadrupeds of tropical and temperate regions have passed away.

On the 3rd April our main sledging parties left the ship for their long, toilsome, and perilous journeys. It was an affecting parting, for all knew the dangers and risks that must be encountered by the travellers, and felt how unlikely it was that we all should meet again. After the departure of the sledge parties, we remained thirteen souls on board the ship, including the sick. On the 17th April I first noticed drops of water trickling down the face of a dark rock exposed to the full force of the sun's rays. On the 24th, I left the ship in company with Lieut. May, taking the dog-sledge and seven dogs. Our instructions were to proceed to the southwards as far as Lincoln Bay, and endeavour to find a practicable land route in rear of the various headlands which descend abruptly to the sea between that point and winter-quarters. This survey was very necessary, as in the event of the ice in Robeson Channel breaking up and entirely detaching from the shore, a land line of communication with the 'Discovery' was imperative. The temperature at starting was −20°, sufficiently low to give us an adequate idea of the misery inseparable from Arctic-sledging. Whilst labouring at the sledge, exerting oneself to the extreme limit of human endurance, no matter how low the temperature, the perspiration pours from one's body, and all underclothing becomes soaked. Whenever a halt occurs this condition of affairs becomes reversed, and the wet under-garments become frozen. Such sudden changes are very painful to bear. Our little party returned to the ship on the last day of the month, having satisfactorily carried out the object of its despatch by finding a practicable land path to Lincoln Bay. Though this short trip enabled me to add very considerably to our acquaintance with the geological features of the country, so far as notice of animal-life was concerned it proved nearly blank. A single Hare, which we shot and brought back to the ship for the sick, with a few Lemmings, were the only living things that we encountered.

On the 11th May I again left the ship with the dog-sledge and a party under the command of Lieut. Egerton, for the purpose of surveying the United States Range of mountains lying to the north-west of our winter-quarters.

I know of no record of travel so monotonous as an Arctic sledging journal; and though I have endeavoured to compress my experiences as far as possible, yet I feel that I owe an apology to the readers of 'The Zoologist' for the length to which these notes have already extended. Day after day the same difficulties are encountered and overcome by an enormous expenditure of energy. Rugged ice is met with that will only yield a passage to the sledge by the use of the pickaxe; soft snow, into which the sledge sinks and requires the utmost exertion of men and dogs to extricate it; places are come across where dogs and sledge have to be lowered by ropes and hauled up again; add to these difficulties, low temperature, frost-bitten fingers, snow-blindness, and generally great thirst, with no possibility of relieving it. When the camping place is reached men and dogs are thoroughly fatigued, and it requires all the remaining energy of the party to pitch the tent, feed the dogs, and prepare some food before crawling into the sleeping bags. During the march it is almost impossible to leave the party, as, if the travelling is bad, an undue share of labour is thrown upon one's comrades; whilst, on the other hand, if the travelling be exceptionally good, the man who stays behind to collect specimens or wanders from the track, runs the chance of being lost, and, in any case, has a large amount of "leeway" to make up. I refer to these facts for the consideration of others who may be tempted, in the future, to undertake a similar journey to this region in the interests of Natural History. Let such a one remember that the difficulties attending research in the far north are equal to, if they do not exceed, those which the traveller in any other part of the globe can encounter, and consequently his expectation of results must not be too sanguine.

On the 13th we reached Depôt Point; the temperature, at +15° when commencing the march, felt very warm. The dogs seemed to feel the heat greatly; whenever we halted they threw themselves on their backs, and rolled in the snow. A wind springing up, the temperature fell to −5°. We camped under the cliffs of Depôt Point. A Snow Bunting, flying from rock to rock, cheered us with his sweet song. It was the first of the species we had met with that spring. The edges of the hummocks exposed to the sun's rays were dripping, and icicles six feet in length were hanging from their sides. We had observed during the march the tracks of a Wolf, and those of Lemmings on the floe, several miles from land. The 14th was spent in ascending a hill some 1500 feet in altitude, about four miles to the westward of camp. From the summit we had a fine view, and fixed on a promising-looking valley to the northwards, which debouched upon the coast in about lat. 82° 40′ N., as most likely to give us access to the United States Mountains. We saw that day a pair of Ptarmigan, *Lagopus rupestris;* they were very tame. I shot the male first, and the female did not move from the side of the dead bird.

On the 15th, after a very arduous day's work across a broad inlet, where the ice consisted of rugged blue-coloured floes of ancient ice, we gained the broad valley leading to the westward, which we had observed from our look-out station of the day before. About half a mile from the shore we disturbed a Snowy Owl from the ground; it flew across our path and alighted on a hill-side. I and Frederic, the Greenlander, left the sledge and went in pursuit, but, after several weary miles' walk, had to give up the chase. The wary bird always rose when we got within a distance of eighty or a hundred yards.

The 16th turned out very foggy, and as we advanced inland the snow became so soft and deep that the united exertions of men and dogs only enabled us to advance the sledge a few hundred yards in an hour. Finding further progress to the westward with our laden sledge impossible, owing to the softness and depth of the snow, we determined to go into camp; and the next day Egerton, Frederic and I started with the empty dog-sledge and one hundred feet of line, with a view of ascending a noble mountain, which we christened on the spot "The Great Pyramid," but which afterwards received the name of Mount Grant. We were in hopes of ascending this fine peak, which rose from the northern slope of the valley, at a distance of some ten miles from camp, by taking advantage of the rising terraces on the northern face of the valley, and attaining a point on which the magnificent snow slope of "The Great Pyramid" seemed to abut. After five hours hard travelling we reached this point at an elevation of some nine hundred feet above the sea, meeting on our way with many tracks of Musk-oxen, a good deal of withered grass in spots, two Ptarmigan, and a single Snow Bunting; also the tracks of Fox, Hare, and Lemming. The rocks, where exposed, consisted of coarse quartzose-grit. Leaving Frederic and the dogs at this spot, Egerton and I climbed the shoulder of the hill and ascended to its summit, an elevation of 1825 feet by aneroid. From there we had a good view, as we looked to the northward across James Ross Bay over the frozen Polar Ocean, whilst directly below us was a tremendous ravine, which, cutting through the ridge on which we were standing, effectually cut us off from the slope of "The Great Pyramid," the height of which we estimated at 5000 feet. Failing in the main object of our day's enterprise, we then attempted to travel to the westward, but the softness of the snow prevented our proceeding over four or five miles; the dogs sank up to their backs, and advanced by a series of bounds; we could only get along by hanging on to the back of the sledge. We returned to camp after thirteen hours' continuous hard work, completely worn out.

We remained in this valley during the 18th, 19th, and 20th, making excursions in various directions. We procured a few Hares and two or three couples of Ptarmigan, and saw a few Snow Buntings, which were mating by this date. Having fixed the position, and taken the altitude of several heights in the neighbourhood of the valley where we had encamped, we shifted our quarters and moved to the southwards. On leaving the ship we were provisioned for fourteen days, the full extent to which our sledge could transport food for ourselves and dogs. Consequently, on the 24th May our party returned to the 'Alert.'

On arriving there we found Captain Nares and Lieut. May prepared to start on the following day, with a dog-sledge, for Cape Joseph Henry and the northward, it being the Captain's intention to investigate personally the condition of the ice on the northern shores of Grinnell Land. An invitation to join this party was gladly accepted by me, and after a good meal, a change of clothes, and a refreshing sleep in a warm bed, I started again from the ship on the 25th. On the 26th we left our camp at 7 p.m.; the weather misty, and blowing strong from the north, our leader walking in advance, found considerable difficulty in steering a course over the floe,—however, we struck the shore-ice about a mile south of Depôt Point, the position we were aiming for. A Wolf followed us all through that march, so Mr. May and I dropped behind the sledge and hid ourselves under a hummock in hopes of outwitting this animal, but he suspected us and did not give a fair shot. I noticed that the gait of this Wolf was more slinking than that of our Eskimo dogs; it carried its tail in a drooping manner. This beast appeared to be about half as big again as our largest dog. The

27th and 28th may be dismissed with the remark that they were two days of uncommon hard work for both the men and dogs of our party.

The 29th saw us encamped near Cape Joseph Henry. This was a beautiful day, and Captain Nares determined to take advantage of the clearness of the atmosphere, by ascending Mount Julia, a hill in the neighbourhood. Accompanied by one of the men, and carrying a theodolite between us, we left camp at five o'clock in the evening. After a stiff climb of six hours' duration we reached the top of the hill, an altitude of 2000 feet. From that point we obtained a magnificent view. Though mist and cloud hung over the valleys immediately beneath us, yet in every other direction our range of vision was unobstructed. To the northwards over the Polar Ocean we could see at least fifty miles; and a careful examination through the telescope showed that within that range, not a pool of water—not even a water cloud—was discernible to break the dreary monotony of piled-up ice. No land, or any trace of land, was perceptible. Our hearts sunk within us when we gazed upon this scene of appalling desolation, for we felt at once how futile must have been the attempts of Markham and his brave companions to make a long journey in the direction of the Pole over such an area as there lay beneath us. After taking a series of angles, which was bitterly cold work, and building a cairn, we commenced our descent of the hill. Mount Julia is composed of a hard blue-coloured carboniferous limestone, containing a considerable assemblage of fossil remains. After returning to camp and getting a meal—time being too precious to expend in sleep—I started with one of our men along the shore to the northward. We saw a pair of Ptarmigan, the female of which we shot. This bird was in full summer plumage, and may be recorded as the most northern ornithological specimen ever secured, having been killed in lat. 82° 46′ N. We returned to the tent on the afternoon of the 30th, the wind having commenced to blow from the northward very cold, with sleet and snow. Throughout the whole of that night Captain Nares and I, and two of the men, laboured in the ravines collecting fossils, and by the morning of the 31st a goodly pile was stacked in front of the tent. From a spell of work of over thirty-six hours' duration, we were glad to turn into our bags. After four hours' rest, Captain Nares and I again visited the fossiliferous strata, and added to our collection. It would be merely recapitulation to recite the incidents of each day separately; suffice it to say that we gave ourselves barely sufficient time for meals, and hardly any to sleep.

On the 1st June we moved camp a little further northwards, but found our travelling much impeded by the weight on the sledge. The 2nd June turned out a wretched day, with snow and mist, and we failed in an attempt to reach the actual promontory of Cape Joseph Henry. By the evening of the 3rd we had to start on our return journey to the ship. Shortly after leaving this our most northern camp, we came upon an almost entire skeleton of a Musk-ox. Heavily laden as our sledge was with fossils, I could not help transferring the skull* of this animal to it. As it was, we were very often obliged to unpack the sledge and proceed with half loads, going back for the residue. From the large collection of carboniferous fossils that we made near Cape Joseph Henry, we were only able to take away a selection; and a very large collection, ready for transportation, is now lying on the coast of Grinnell Land, in lat. 82° 45′ N.

Up to the date of the 5th June, I had only observed the following species of birds since the return of daylight, namely, Snowy Owl, Snow Bunting, and Ptarmigan. We had just got into our bags on that day, when the cook called out that there was a Ptarmigan close to the tent, so I crawled outside and shot it. Whilst returning to the tent I heard the cry of some waders, and, looking in the direction it came from, saw a flock of fourteen Knots, *Tringa canutus*, circling over a small bare patch near the summit of a hill, where they alighted and commenced picking. To get near them was very difficult, the sun's heat had turned the hill slope into ice. Over and over again I fell down, sometimes sliding back several paces, at another time breaking through the ice-crust and sinking above the knees in the sodden snow. As often happens under analogous circumstances, just as I was getting within range the Knots gave a merry whistle and made off. By this time I was dripping, with tumbling about in the wet snow, but seeing three Hares feeding further up the valley, went in pursuit of them; my efforts, however, were not successful. Before reaching camp a pair of

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* This specimen is now in the collection of Mr. E. R. Alston.

Knots rose in front of me, both of which I killed. They were male and female, in rich breeding plumage; their stomachs were full of the buds of *Saxifraga oppositifolia*, the plant around which I had seen them circling. Later on in the day I observed other parties of Knots, and with them a few Turnstones and Sanderlings.

On the 6th, as we journeyed along, a Buffon's Skua, evidently hunting for Lemmings, passed near enough to the sledge to be recognizable. That day a single open blossom of *Saxifraga oppositifolia* was found; it is needless to remark how much it gladdened our eyes. The transient summer of the Polar zone was near at hand. As we passed along through the softening snow, Knots and Turnstones were to be heard calling around us, and insect life, in the shape of flies and midges, was once again awakened. A Seal, *Phoca hispida*, was seen lying on the ice of Dumbell Bay as we passed by. On the evening of the 7th June, the party with which I had been travelling returned to the ship.

On the following day Lieut. Parr arrived with the news of the utter prostration of Markham's party from scurvy. They had been fortunate enough to reach the land and get some supplies at the depôt near Cape Joseph Henry, and were then toiling slowly and sadly homeward. In less than three hours after Parr's arrival, the dog-sledge with Dr. Moss and Mr. May had started to the succour of Markham's party: an hour later a couple of sledges, with Captain Nares and every available officer and man in the drag ropes, proceeded on the same service. Early in the morning of the 14th Markham and his party were safe on board the vessel. On the 9th four Brent Geese were shot, and on the 12th several pairs were flying along the coast-line, apparently in search of bare places to alight on where a sprinkling of vegetation was to be found. Such spots were still few and far between.* On the 16th I observed three Arctic Terns, *Sterna macrura*, in the neighbourhood of winter-quarters.

The insurmountable obstacles encountered by Markham during his journey over the Polar ice, having fully demonstrated the futility of a renewal of the enterprise in the following year, Captain Nares announced his intention to abandon all further exploration in a northerly direction, and to proceed southwards, if possible, during the navigable season of 1876. Permission having been granted us to make use of what remained in the depôts of supplies that had been laid out for the exploring parties, Parr and I left the ship on the 19th June, dragging with us a small satellite sledge, which transported our guns and ammunition, and a change of clothing. The floe, though covered with pools of water, still afforded tolerable travelling, though every hour the thaw was advancing with astonishing rapidity. During our first march from the ship we saw three Arctic Terns, and flushed a Dovekie from a pool, which however got away. At Mushroom Point a pair of Buffon's Skuas were seated on a bare ridge of gravel; one of these we shot whilst it was busily employed feeding on a Lemming. We arrived at Dumbell Bay early on the 20th, where we shot one of a pair of Brent Geese, and a single Ptarmigan and Sanderling; we searched diligently for the nests of these birds, which we believed to be breeding in the vicinity, but without success. This was the total amount of bird-life that we met with in that locality. The morning of the 21st found us at Knot Harbour, the spot where we first met with *Tringa canutus* on the 5th June. A tent having been left there for the convenience of the travelling parties, we determined to make this spot our head-quarters, as the country around was tolerably bare of snow, and several valleys leading from the sea-coast offered shelter and a chance of subsistence to birds and animals.

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* No flocks of Brent Geese, or indeed a single individual of this species, or any of the *Anatidæ*, were seen winging their way due north over the Frozen Sea, which would have been the case did migration extend in that direction. In every instance they clung to the coast-line.

The number of each species of bird that visits the northern shore of Grinnell Land is extremely limited; we only found some five pairs of Brent Geese nesting within a radius of several miles of Knot Harbour. Knots were rather more abundant; their cry reminded me somewhat of the Curlew, *Numenius arquata*. The nearest approach that I can make to describing the note, are the words "Tullawee Tullawee whee whee," repeated over and over again: the last two notes are much prolonged, and sound very mournfully. When these birds were mating I frequently saw a female pursued in the air by a couple of males at the same time. The Knot has not the power of drumming like the Common Snipe, but, after soaring in mid-air with outspread pinions, they frequently descended to the ground. During this descent the wings were beaten over the back with such rapid motion that a loud whirring noise was produced, which might be heard at some distance. According to my observations, this action was confined to the males and to the period of courtship.

Two magnificent Snowy Owls, evidently breeding, haunted a valley some two miles from the tent; they were very wary birds, never alighting where it was possible to approach them under cover. On one occasion, after disturbing these Owls, they flew over a spot where a Brent Goose was sitting. The goose rose from her nest and made directly at the Owl, following it, and driving it off for some distance. This action on the part of the Goose disclosed her nest, which we found to be a comfortable structure of down, placed on a base of Saxifrage stems, grass, and moss, and containing four eggs. The gander was close by, and ran hissing at me when I interfered with the nest. I felt very sorry to kill these poor birds, but I had scurvy-stricken men on board ship, whose recovery depended upon a supply of fresh meat. On the 22nd I noticed a pair of Turnstones feeding; from their actions I felt confident that they had a nest not far off, but, after watching them for more than an hour, the cold wind forced me to move on. I was greatly interested by seeing these birds actually turn over and reverse pieces of slate, three inches in diameter, and pick up the spiders and *Acaridea* that were to be found underneath them. The bird put its bill fairly under the centre of the slate, and then pitched it over with a good toss of the head. I saw it perform this action within twenty paces of where I was lying, and ran forward and picked up the piece of slate, the damp under-surface being exposed as it lay on the dry shingle. This relic I brought home with me, and still retain.

On the 23rd we found a nest of Buffon's Skua, *Stercorarius parasiticus;* the two eggs were laid in a depression on a gravel flat; they were of a delicate green ground colour, and, except in being somewhat smaller, hardly differ from those of Richardson's Skua, *S. crepidatus.* The old birds were very bold, and tried to drive us from the vicinity of the nest by darting at our heads.

All through the 24th it blew a strong warm gale from the S.S.W., which worked a rapid change both on the floe and on the shore; the former was now covered with pools of water, and down the land-slopes rivulets were pouring in every direction.

The condition of affairs warned us to be off, but another day's search after the nest of *Tringa canutus* was decided on.

On leaving the tent, Parr and I separated. The strong breeze seemed to have driven the birds to seek shelter; for several hours I wandered without seeing a living creature. Towards evening I observed a Glaucous Gull hovering over a fresh-water pool some distance inland, and passed a Buffon's Skua feeding on a Lemming; it allowed me to walk within twenty paces of it, and then backed away from me, at the same time making violent attempts to swallow the Lemming, in which it at last succeeded. Whilst walking along some old gravel beaches, at a height of some 800 feet above the sea, I saw a Sanderling running like a mouse amongst the stones. Throwing myself flat on the ground, I watched the bird circling round and round, until at last it returned to near the very spot where I had first observed it moving. The nesting-place was a depression in the centre of a plant of *Salix arctica*, and was lined with a few dried leaves and catkins of the plant; the eggs, two in number, may be compared to miniature Curlew's, but the ground colour is not so green.* The sitting bird proved on dissection to be the male.

Late in the evening, whilst returning to camp, I met Parr carrying three Brent Geese, who informed me that he had found the nest of the Snowy Owls in Hare Ravine; but knowing that I should like to see the eggs *in situ*, he had refrained from touching them. It was about 9 P.M. when we retraced our steps to the Owl's nest, which was placed on the summit of a small hill in the bottom of the valley; the eggs, seven in number, lay on the bare ground in a small depression which had evidently been scraped out by the birds. Hiding behind a rock, I waited the return of the birds; in about half an hour the larger of the pair came hovering over the eggs, and fell to my gun. I drew back on the chance of the cock bird coming within range. In a short time he came hovering over, crying "Whew, whew." Imagine my mortification when the bird I thought dead rose to its feet, got the wind under its wings, and sailed away across the valley, accompanied by its mate. I started in pursuit, but a "stern-chase" through heavy snow is a long one; and though I followed the bird for miles, and often got within a hundred yards, yet in the end it escaped; it was three o'clock in the morning of the same day before we got back to camp.*

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* These eggs are figured in the Appendix to Sir George Nares' 'Voyage to the Polar Sea,' vol. ii., p. 210.

Whilst waiting at the Snowy Owl's nest we found a Snow Bunting's, containing three eggs; it was a well-made structure of grass, lined with the feathers of *Nyctea scandiaca.* Blowing eggs, skinning birds, and packing up our sledge, occupied us till mid-day, when we started for the ship, as every hour the rapidity of the thaw was increasing the risk of travelling over the floes. It may have been observed in this short account of my sledging experiences, that not unfrequently we were obliged to carry on without lying down to rest through twenty-four, thirty-six, and in some cases over forty hours of work. This, I think, would be hardly possible in regions where there is night and day in the twenty-four hours, but during the long continuous day of the Polar summer the human system seems capable of bearing up against the want of sleep in a truly remarkable manner.

Leaving our camp we dragged our sledge on to the shore-ice, which extended for about a mile to seaward; and though it was covered at this season of the year with a layer of icy-cold water, which reached to our knees, yet beyond the discomfort of wading through water at 32° F. the travelling was tolerable and the sledge pulled easily; but when we reached the old floe, and from there to Simmond's Island, the travelling was truly execrable. In the sodden snow which lay between the ice-hillocks and ridges of the ancient floes we often sunk up to our hips, and slush and ice-cold water reached above our knees. Over and over again, as we tugged at the deeply-imbedded sledge, it moved suddenly forward, throwing us on our faces, and we found no little difficulty in regaining an upright position. However, we reached Simmond's Island by 6 P.M., took our guns and walked round it. We saw four pairs of Brent Geese on it, and found three nests; one contained five eggs, the others four. The nests, as usual, were solid structures of grass and moss, the eggs being buried in a mass of down from the breast of the parent bird. We shot five out of the eight geese breeding on this island. By 8 P.M. we were back to the sledge, lashed on the dead geese, and were again in the drag-ropes. The journey from the island to the mainland was equally arduous as that we had encountered in the first part of our march, and our sufferings were aggravated by its blowing half a gale of wind in our faces. We reached the camping-place on the mainland at 12 P.M. nearly exhausted, and so benumbed by cold that it was as much as we could do to prepare our supper.

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* The eggs from this nest of *Nyctea scandiaca*—seven in number—passed safely through the ordeal of the sledge journey, and are now in the British Museum.

After a good sleep in the tent at Dumbell Bay, we started at mid-day of the 26th. The travelling to Mushroom Point was particularly bad; often times we sank to our waists, through a foot of water and then sludge. The satellite sledge got buried, and we had to face about and extricate it by "standing-hauls." We reached Mushroom Point in the evening: from there to the ship we saw a single Glaucous Gull, several Buffon's Skuas, several pairs of Arctic Terns, a flock of fifteen King Eiders, one of which we obtained; and a single Fulmar Petrel passed us at about seventy yards distance. During this march we encountered real rain, for the first time that year. The ship was reached early in the morning of the 27th June.

During July, and particularly in the first half of the month, the explorer of Polar lands has to contend against an enemy more potent even than the cold in contracting his walks— I refer to the thaw. Every valley and ravine was occupied by a stream; many of these became rapid foaming torrents that it was extremely difficult to cross without the aid of bridge or boat; the flats were converted into lakes, snow-drifts into treacherous sloughs impossible to wade through. To seaward the pack was equally difficult to cross, and even dangerous to venture on. Thus it will be seen that our area for walking over was practically very restricted. A few Phalaropes, *P. fulicarius*, were observed, and one or two examples secured, though I did not discover the nest. The bill of this species when in full breeding plumage is bright orange, tipped with dark hair-brown. The female is larger and brighter coloured than the male.

I noted on the 1st July that the Knots were still courting; the males were chasing the females, and uttering their shrill melancholy note. The melting of the snow placed the Lemmings at great disadvantage with their enemies, the Skuas. No longer were they able to dive with rapidity into a snow-drift or take refuge in their numerous galleries; the sole place of retreat was under stones. When overtaken in the open the little creatures showed fight; they are extremely tender, the slightest tap killing them at once. Buffon's Skua hovers over its prey very much like the Kestrel, *F. tinnunculus*, with rapidly beating wings and expanded tail.

On July 5th Mr. Parr fell in with three Musk-oxen about two miles and a half from the ship; he managed to secure all three of them—a young bull and two cows. These animals were thin and in poor condition. On the morning of the 6th a fair-sized bull was seen on the shore, not far from the ship. Several of us ran out to shoot it, but Dr. Moss was the fortunate one who secured it. This animal having been killed in close proximity to the ship, Captain Nares gave me permission to take the hide and skeleton, provided that I saved the meat for the use of the ship's company.* The weight of the meat that I sent on board from the carcase amounted to 211 lbs.; the heart, liver, and kidneys to 12 lbs. more.

Night after night I passed out on the hills trying to find the nest of the Knot. Not a day passed without my seeing them feeding in small flocks; but they were very wild, rising with shrill cries when one approached within a quarter of a mile of the mud-flats on which they were feeding. It is very extraordinary, considering the hundreds of miles traversed by myself and my companions,—all of us on the look-out for this bird's eggs, and several of us experienced bird's-nesters,—that we found no trace of its breeding until the young in down were discovered.

I found two or three species of Collembola very common in the neighbourhood of Floeberg Beach; one especially, probably *Podura hyperborea*, was to be seen in myriads on the surface of the snow, and also floating on the surface of the little rills that were fed by the dribbling from the snow. I made several attempts to dredge through cracks in the outside pack, but all proved nearly or quite unsuccessful. There was not sufficient length of fissure in any place I could reach to give the dredge a fair sweep, or to allow the lip to scrape the bottom. We had, therefore, to content ourselves with the specimens captured in baited traps let down the fire-hole.

On the 11th July, the water in the ravines and torrent-courses having considerably decreased, I again left the ship in company with my indefatigable messmate, Mr. Parr. Our idea was to proceed to the tent at Dumbell Bay, make use of the residue of the provisions left there, and thoroughly explore the neighbourhood of that locality, Captain Nares having granted us permission to be absent from the ship for one week. On this occasion we took no sledge, as travelling over the floes was not to be depended on, but carried our ammunition—a change of under clothing and collecting gear—on our backs, the equipment amounting to 28 lbs. in weight for each of us.

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* This animal is now in the British Museum.

The stream in the first ravine north of winter-quarters was still running strong; we selected the widest and shallowest place for crossing, but though only half way up our thighs it was quite as much as we could do to retain our foothold. The water was bitterly cold, and we were nearly benumbed on reaching the opposite bank; after wringing out our wet garments, we proceeded. In the bottom of the next ravine we descried two Brent Geese and a flock of twenty-eight Knots feeding, but they were very wild, and rose long before we got within shot. The temperature was tolerable and the travelling excellent, as we kept along the gravel ridges parallel to the shore, which marked the lines of upheaval of old sea-beaches. The next broad stream reached we flanked by going out on the floe; and, as it was low-tide, the water nowhere lay deeper than a foot. Near Mushroom Point we came upon a pair of Buffon's Skuas breeding, and took their two eggs. The audacity of this bird is surprising; when near the nest they attacked us with the greatest vigour, darting at our heads; and not until I had struck the hen bird a rap with my gun-barrel did she cease from her assaults.

The scanty flora, at that time bursting into bloom, excited our interest and attention. Accustomed as we are in England never to be without the sight of vegetation throughout the year, it is difficult to realize, until it becomes a fact, the enormous deprivation involved in the entire absence of leaf, flower or shrub, for ten months out of the twelve. I can hardly describe the pleasure we felt in seeing the delicate green leaves of the willow, the yellow blossoms of the poppy, the diminutive flowers of the *Drabas*, and, above all, those of the most wide-spread and abundant of Arctic plants, the purple saxifrage. That lovely flower, then at the very height of its bloom, coloured purple some of the brows and banks which we traversed.

(To be continued.)

ORNITHOLOGICAL NOTES FROM WEST SUSSEX.

By William Jeffery.

I had intended recording the occurrence of two Night Herons in full plumage, shot at Earnley, near Chichester—a male on April 28th, and a female on May 1st, 1876. I saw both specimens in the birdstuffer's hands. Since then I have seen (December 17th, 1877) a specimen of the Little Owl, said to have been shot at Earnley; and a second was reported, captured alive at the same place—all four birds by the same gentleman. This second Little Owl I obtained possession of on 21st May last, and kept it alive until November 24th, when it died. I now record these four occurrences with much reserve, having lately heard that the Little Owls were obtained in the London market;* rendering also the facts relating to the Night Herons doubtful, though the birdstuffer maintains that all are genuine.

On November 1st, 1876, Mr. Willet, of Brighton, informed me that a Glossy Ibis had been shot near Arundel about a month previously, and had come into his possession. About this time a Grey Shrike was shot at Nutbourne, near Emsworth, and a Rough-legged Buzzard at Wittering. I saw both specimens, and know the gentlemen who shot them. About the 20th December a Temminck's Stint was obtained on the coast. On November 19th I saw a Marsh Harrier at the birdstuffer's, shot at Sidlesham a few days before. It was purchased by the Rev. A. Fuller, of Chichester. On December 17th a Little Gull was shot at Itchenor; and on the 27th an adult female Peregrine, killed at Bosham, was purchased by Mr. F. J. Freeland.

During the autumn migration of 1878 about a dozen Greenshanks had returned to Bosham Harbour as early as the 10th July, and a Common Sandpiper was seen at Selsey on the 15th. About the middle of August the insectivorous birds commenced their southward movement. On the morning of the 23rd, after a night of heavy rain with south-east wind, our hedgerows around Ratham were full of Common Whitethroats; and up to the 29th they were still numerous. It has always been a question with me whether such birds as these continually pass on by flitting from hedge to hedge, or whether they rest and await a more favourable time for their passage across the sea. Ray's Wagtail seems to pass by in short flights, sometimes dropping down in small parties amongst the cattle and sheep, and, if disturbed, continuing their southward course. This occurs from about the middle of August until the end of September. The Whinchat is moving during the same interval, and is seen in small parties of ten to twenty perching on the low hedges, or on plant-stems in our meadows—here to-day and gone to-morrow. The Turtle Dove was last seen September 24th.

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* See 'Zoologist,' 1877, p. 296.

By September 27th the Lesser Redpoll had arrived, and throughout the early part of October was plentiful, feeding on the seed of the Willow Herb (*Epilobium*) growing by our ditches, their usual winter food being the seed of the alder.

For the last two summers (1877-8) a pair of Pied Wagtails built their nest and reared their young on the framework underneath a third-class carriage running daily four times to and fro between Cosham and Havant, a loop line on the South Western Railway—the distance traversed during the day being about forty miles. While the train was on its journey to Havant and back the male bird might be seen anxiously awaiting its return either on the telegraph-wires or the turn-table at Cosham Station. Last summer these Wagtails narrowly escaped a calamity, the carriages composing the train having been ordered away for renovation; but the station-master at Cosham, by making "their" carriage the last to go, just managed to avert it.

Last summer a pair of Robins reared two broods of young *in the same nest* in my garden at Ratham, nothing having been done to the nest after the first brood had flown. Robins, as well as other birds nesting in my garden, are much annoyed by Sparrows destroying their nests or thrusting their bills into the eggs and carrying them off; and Robins stand a poor chance if they do not conceal their nest well. This may, perhaps, account for the same nest being twice used. On the other side of the garden, a pair of Robins quickly took possession of an old pitcher purposely lodged in a tree for them; but no sooner was the nest finished than the Sparrows destroyed it. Blackbirds, Thrushes, Wagtails, and Flycatchers have all in their turn been disturbed by these pugnacious birds.

Two pairs of Robins occupy my garden this winter, each keeping their respective sides, neither pair venturing far over a middle path without a chase from the other, ending either in an engagement or retreat. One Robin out of the four is much tamer than the rest, coming close to me, often settling on the handle of a spade or prong when stuck in the ground unused, and keeping a sharp look out for worms or insects turned up, not refusing worms when thrown to him, nor appearing frightened by the action of the hand in throwing. If, however, my work lies on the opposite side of the garden, my friendly Robin keeps aloof, cheering me only by his song. Bird as well as man has his frontier line to protect. Occasionally a Gray Wagtail, which is otherwise allowed occupation, is sharply served with notice to quit the land of Robins. The Grey Phalarope last autumn was conspicuous by its absence, not a single specimen having, to my knowledge, been seen here.

Referring to my note in 'The Zoologist' for October last (p. 392), I have to report that four other Hoopoes, in addition to the two there recorded, were shot at the same place. The first two, sold to the Rev. A. Fuller, of Chichester, were killed by a fisherman named Grant, on August 22nd, at a place between Sidlesham and Selsey, called Woolhouse, or, in the vernacular, "Ooollas." On the 24th two others were shot there by Mr. Woodman; the remaining two on the 31st of August and the 1st of September—one of these also by Mr. Woodman. I saw them at the birdstuffer's, and, with one exception, I believe they are all old birds, and this one may have been a bird of the year, but I am not sure. The late Mr. Yarrell, in his work on 'British Birds,' writes, "It seldom makes its appearance in this country till after the breeding season is over; and the period of the year in which this bird most commonly occurs is in autumn." My own experience hitherto has been just the reverse. The only autumn-killed specimen that I have recorded was procured towards the end of September, 1866. Mr. A. E. Knox, in his 'Ornithological Rambles in Sussex,' mentions three instances of the occurrence of the Hoopoe in September. The usual time of their appearance in the spring is from about the middle to the end of April, just the time when the greater part of our summer visitors are arriving. Two instances are recorded of the Hoopoe having nested in Sussex: one is mentioned by Yarrell as having occurred near Chichester; the other by Mr. Knox as having been observed at Southwick, near Shoreham. There is little doubt that they would oftener remain to breed here if unmolested, and it is much to be regretted that they are not allowed the opportunity of doing so. The stomach of one which I examined (killed April 18th, 1865) contained the remains of twenty to thirty larvæ of beetles, apparently those of the cockchaffer, *Melolontha vulgaris;* many of them almost perfect, and nearly one inch and a half long.

ORNITHOLOGICAL NOTES FROM DEVON AND CORNWALL.

By John Gatcombe.

On October 7th, on which day it was blowing very hard, I observed Swallows for the last time in the neighbourhood of Plymouth. The following day many Cormorants, Shags and Terns appeared in our bays and estuaries; but I saw no Phalaropes, except one said to have been obtained on Dartmoor. Many Terns, both Common and Arctic, arrived, and several were brought to our birdstuffers. The bill of one of the young Arctic Terns I examined was the shortest I ever saw, in comparison with the size of the bird, measuring only three-quarters of an inch from the tip to the commencement of the feathers on the brow, and an inch and a quarter to the corner of the gape.

On October 12th two Northern Divers were seen in the Sound—one, from the description given, an adult, the other a young one. My informant said that the old bird had a black and white ring round the neck, and when approached continually rose and flew a short distance, at the same time calling as if to entice the young one away, but the latter would not rise. However, they both managed to keep out of shot by diving and swimming. When chased by a boat, I find Northern Divers rarely attempt to escape by flying, but I have known them do so in a few instances. It is not uncommon to see them circling high overhead, apparently on the look out for a good place to alight, or bound for a long journey. On a very calm day, about the commencement of spring, many years ago, I remember having seen between twenty and thirty Northern Divers in Plymouth Sound, apparently in pairs. They continually called to each other on the eve of going below, and again on rising to the surface. These birds appeared to have collected previous to their departure for the north. We chased many for about two hours, but without any satisfactory result. Their cry is very melancholy, especially when wounded or hard pressed. Many writers assert that the action of this bird in going under water cannot be easily explained in words. The numbers that I have closely watched seem to me, when quietly fishing in bays, to first sink the body and then to give a simple plunge forwards, with the neck a little arched and the bill pointing downwards; but if unexpectedly disturbed or closely pursued, there is, of course, more of a sudden start and splash. Mr. Saxby, in his excellent work on the 'Birds of Shetland,' says that "the Northern Diver can, in smooth water, see a boat and its moving shadow from beneath the surface for a considerable distance, and hence the bird is more frequently dodged and shot during a breeze." But I have met with several instances in which the bird when pursued—and in very calm water, too—has come up close to the boat, and, on one memorable occasion, right under the angle formed by the oar from the gunwhale to the water, and this being the first and only adult in full summer plumage I had ever pursued, quite took away my breath. We lost it after all.

A fine Common Buzzard and several Herons were received by the birdstuffers during the second week in October. The latter were plentiful in our estuaries and rivers, and I have always remarked that severe cold weather has a great effect on Herons, and on Kingfishers as well. Shortly afterwards there were many Widgeon and two young Red-breasted Mergansers in our market, and three Grosbeaks from different localities near Plymouth, and one from Milton Abbot. This species is certainly not at all common in the county. I observed some Oystercatchers flying up the harbour, uttering their peculiar cry, which Mr. Saxby says the Shetlanders liken to the words "my feet." On the 22nd I observed the last Wheatears—not very late. I may here mention that a correspondent in the October number of 'Science Gossip' sends a note on the occurrence of the Russet Wheatear, *Saxicola stapazina*, in Lancashire—a species the occurrence of which I have for years anticipated, and longed to hear of on our side of the channel, wondering why a straggler, at least, should not occasionally appear at the same time with its near relation, *S. œnanthe*. Many Short-eared Owls, and one Long-eared, were killed about this date near Plymouth, and a Reeve on Dartmoor. A Brent Goose, some Redshanks, Herons and Curlews were exposed for sale in the market, and a Snow Bunting was killed on the 26th. Snipes, both "full" and Jacks, were plentiful, one of the former weighing six ounces.

November 1st was very cold, with the wind N.E. True to their time, Black Redstarts made their appearance, and several were caught, and doubtless starved to death by the birdcatchers, who, I am vexed to say, have become a nuisance in the neighbourhood of Plymouth. One Redstart was killed by a coastguard man with a single ball from his rifle. This man is a gunnery instructor, and the best shot I ever met with. Divers and Cormorants, swimming within any reasonable distance, stand not the least chance of their lives with him. I have seen him disable a Shag with the first ball, and knock it almost out of the water with the second. He sometimes shoots at a Kingfisher sitting on a rock, and aims so that the ball may not directly strike the bird, but so nearly that the splinters of the rock kill it without much injury to the plumage. The Redstart's head, in the case above referred to, was cut completely off. I once saw another man, a gunnery instructor also, kill a Speckled Diver with a ball between three and four hundred yards off at least. Indeed few people have an idea of the perfection these men have arrived at in the use of the rifle.

During the first week of November a pair of Scaups, a Scoter, and an old male Cornish Chough were killed and brought to Plymouth for preservation, and there were some Grey Plovers and Knots in the market. A warrener from Dartmoor told me that a Peregrine Falcon had for a long time frequented the place, and that he had often seen it knock down Curlews and Wood Pigeons on the moor, but that he could never manage to get a shot at it. A Dartford Warbler was killed and sent up from Cornwall by Mr. D. Stephens; also a very pretty variety of the Water Rail, with a pure white patch covering the back of its head. About the same time I examined a beautifully marked brown and white variety of the common Thrush. Several Northern Divers were killed in the neighbourhood during November, and I heard Whimbrels flying up the harbour by night—rather late in the season for these birds. Kingfishers were very numerous, and almost daily killed, I am sorry to say, by gunners. A fine Merlin, two Northern Divers, a Crested Grebe, and three Herons were brought in to a Stonehouse birdstuffer. Some Turtle Doves also were obtained in this neighbourhood. An ornithological friend, the Rev. G. Robinson, writes me from Ireland that his son had killed some Curlew Sandpipers on Lough Neagh, a new Irish locality for this species.

Early in December the weather was exceedingly severe, and the birds suffered greatly. The following species were brought in to the bird-preservers:—Two Merlins, a Grey Plover, several Razorbills, a Cormorant, and two Northern Divers, making altogether eight of these last-named birds brought in since the commencement of November; also a Sclavonian Grebe, a species which has become scarce of late years, but was formerly often seen in our bays and estuaries during severe weather. It varies much in size, some specimens being half as large again as others, and the upper plumage of the larger birds is generally much darker. During the early part of the month our markets were filled with wildfowl, among which were Woodcocks and Snipes in great profusion, Redshanks, Curlews, Mallards, Widgeon, Teal, Shovellers, Pochards, Scaup and Tufted Ducks, both young and adult, but I did not see a single Sheldrake or a Grey Goose of any kind. On the 13th, however, a female Egyptian Goose was shot and sent up from Cornwall to be preserved, and the next day another, I believe a male; both were fine birds, neither of them showing the slightest trace of having been in confinement. On the 18th there was a Corn Crake, in very poor condition, in the market. Water Rails were exceedingly plentiful, but Moorhens and Coots scarce. Four Oystercatchers were killed on the coast, and I found the stomach of everyone full of limpets. The severe weather had great effect on the Curlews, numbers of these usually wild birds having been shot. Some which were taken alive I bought and restored to liberty. Kingfishers also suffered greatly. Numbers of Herons and a Bittern were killed, the last-named I believe in Cornwall; its stomach, which I examined, contained nothing but the fur of water rats and mice, rolled up in small, hard, oblong pellets.

During December the gardens, even in the middle of the town, were crowded with Blackbirds, Thrushes, Redwings, Starlings, and even Fieldfares, which were regularly fed by many kind-hearted people. Hundreds of Blackheaded Gulls were to be seen daily swimming and dipping in the water close under our quays and wharves, some of them actually settling on the sheds, apparently in a most pitiable plight from starvation; and, strange to say, I noticed one among them with a head as black as it usually is in summer, with the exception of a few very small white feathers appearing here and there, and these only to be made out through a powerful telescope. This happened on December 22nd.

ORNITHOLOGICAL NOTES FROM WEST CUMBERLAND.

By C. A. Parker, M.D.

The district in which these notes have been made may be roughly described as bounded, on the north by St. Bees Head, on the south by the Muncaster Fells and Black Coombe, on the east by Scafell and its adjacent hills, and on the west by the Irish Sea. It is watered chiefly by the rivers Eden, Calder, Irt, Mite, and Esk, the three last uniting in a common estuary at Ravenglass, while at the foot of the hills lies Wastwater, the deepest lake in Britain. So varied a district affords good hunting grounds to a naturalist.

To begin at the mountains with the birds of prey. The Eagle we have no longer: I saw the last of the race some years ago at Ambleside, very badly preserved. The Peregrine is still occasionally seen on the hills: a fine hen bird was brought to me on the 22nd November last. It had forsaken the fell for a richly stocked preserve, where it no doubt had lived "in clover" till it came within range of the keeper's gun. Another keeper told me he shot one in the spring on Birker Fell, and I saw one myself near Wastwater last May. The Buzzard is common here, and almost invariably nests on the precipices, the solitary instance I have been able to discover of a nest in a tree being thought quite a curiosity by the country people. These birds do good by destroying a great number of vipers, but I do not think they have pluck enough to touch grouse, though I have known one carry a hare in its claws, which must have been a heavy burden for a bird of its size. A Buzzard, which was taken when young from the nest, is kept in solitary confinement at Newton Manor. Last spring it laid two eggs, very oval instead of the usual round shape, and only very faintly marked with reddish brown. These were taken, and three hen's eggs substituted, which were duly hatched, two of the chickens being quickly devoured by their fierce foster-mother; the third was reared. The Merlin is common on the fells, where it breeds. I have known of two or three nests lately. The other small hawks are very abundant.

In December, 1876, a specimen of Tengmalm's Owl was shot in one of the Newton Manor coverts, in Gosforth parish, by the keeper. It was an adult bird, in full plumage, and is now in the collection of the Rev. C. F. Smith, of York. The keeper told me he thought it had a mate, but he never saw it after the first was killed. The White, Tawny, and Long-eared Owls are common, especially the latter. I have known nests of all three this year. The Short-eared Owl does not occur nearer than Barrow, where it is not infrequent on Walney Island.

The Raven is perhaps more abundant in Cumberland than in any other English county, especially about Scafell. I knew of two nests last spring, one of which was perfectly inaccessible, and though my friends and I made several toilsome journeys to the other, and succeeded in reaching it by aid of a rope, we got nothing for our pains but a sight of the old birds.

The Great Grey Shrike I have seen once only. The Red-backed Shrike is common, also the Nightjar, and a pair of Crossbills were seen in Wastdale some years ago. The Kingfisher is usually rare, but I have heard of four or five this year, two of which I am sorry to say were shot, and, after having gone the round of the village, found their way to my collection. The Snipe breeds here often: I found a nest by the side of the river Irt last season with four eggs, and am sure there were two or three more nests near. A Woodcock's nest with four eggs was found in one of the Irton Hall covers in May, 1877.

The Dotterel is sometimes seen on the grassy tops of the Screes mountains which border Wastwater, but I have never been fortunate enough to see one myself.

In June, 1877, a Waterhen was brought to me of a light fawn-colour all over except the usual white markings: the tail is lighter than the rest of the body, the legs light-coloured, the bill natural. It was shot on Hallsenna Moor, in Gosforth, by a gamekeeper. On the 5th December I saw a Rook with a large white patch on the left wing. I have also in my collection a Song Thrush, killed in the neighbourhood, with a white blotch on the back of the neck and shoulders, and Dr. I'Anson, of Whitehaven, informs me that he lately saw in an adjoining parish a perfectly white Sparrow.

Albino specimens of other birds seem to be frequent. During the last two years I have seen six pied Blackbirds:—(1) spotted all over; (2) white on both sides of the head—both in Irton parish; (3) white wing, cheek and spot on the back; (4) white head and greater part of body, now in my collection; (5) broad white ring round neck and shoulders; (6) white feather on shoulder and another on the side—all four in Gosforth parish.

Coming nearer the shore, we have in the winter large flocks of Golden Plover and Turnstones. I fired into a flock of birds last winter, and on picking up the seven slain found they were all immature Turnstones. I was sorry to have killed so many, but made the best of it by having five preserved in a group by Hope of Edinburgh.

Of Herons we have plenty; they breed at Muncaster Castle, and may be seen on the shore in flocks of as many as twenty. A Bittern was shot four years ago at Nethertown, and the Water Rail is occasionally seen.

In November, 1877, six Swans appeared on Braystones Tarn, which were supposed to be wild. They remained about the place for about three weeks, and last month turned up again on Bassenthwaite Lake.

Of Ducks we have a varied list. Several years ago a couple of Ferruginous Ducks were killed on Braystones Tarn; the Eider Duck and Scaup have been shot on Wastwater, while the estuary at Ravenglass attracts many species in the winter. Between the river Irt, which forms part of the estuary, and the sea, is a lonely strip of land, about a mile and a half long and a third of a mile broad, consisting entirely of sand-hills. Here the Sheldrake breeds in the rabbit-holes, also the Oyster-catcher, Common Tern, Lesser Tern, Ringed Plover, and numbers of Black-headed Gulls. Wild Duck, Teal, and Widgeon abound, and the Goosander occurs sometimes. A good number of Cormorants are to be seen there through the day: towards evening they fly back to St. Bees Head, where they are said to breed, and the Green Cormorant as well.

A Bernicle Goose was shot on the Irt on the 1st November last. It was alone and very tame. One leg had been broken at some former time, but was quite healed. It is now in my collection. A great number of wild geese have been in the neighbourhood for the last three weeks: three times flocks of more than twenty have been seen together. When only four or five were together they were not wild, having in two instances been within a stone's throw of the observer. Some, but not all, were evidently Bernicle Geese, from the descriptions I heard of them. The Kittiwake, Herring, Greater and Lesser Black-backed and Common Gulls are all to be seen in varying numbers, and when shooting on the shore on November 23rd, 1877, the Rev. C. F. Smith was lucky enough to secure a specimen of the immature Glaucous Gull.

I have never seen the Guillemot or Puffin alive about here, but I have found both birds dead on the shore in a sufficiently fresh state for stuffing.

Among the smaller birds of the district the Mountain Finch and more rarely the Snow Bunting may be mentioned.

OCCASIONAL NOTES.

Voyage of the 'Alert' to the Straits of Magellan.—The following extracts from a letter addressed to Captain Feilden by Dr. R. W. Coppinger, Surgeon and Naturalist of H.M.S. 'Alert,' dated Monte Video, 30th November, 1878, will be read with interest. The 'Alert,' under the command of Captain Sir George Nares, K.C.B., is now engaged in completing the surveys of the Straits of Magellan:—"As our voyage so far has been a rather hurried one, I have had, as you may imagine, but few opportunities of doing Natural History work, either ashore or afloat. The only places as yet touched at have been Madeira, St. Vincent (Cape de Verde), and our present anchorage. During the few days of our stay at Madeira, we dredged several times in the 5—35-fathoms belt, at various stations along the coast for about seven miles to the eastward and westward of the town of Funchal. It did not prove a very productive region in the molluscan way, as I only got representatives of about seven genera of shells, besides a few Annelids, Crustaceans and Echinoderms. *Serpulæ* were very abundant. At Porto Santo (St. Vincent) I spent one day dredging over the 3—12-fathom belt, and there I obtained some fine specimens of *Strombus*, and great numbers of a large blunt-spined *Cidaris*. Of littoral shells, living and dead, many were picked up. On our way down the South Atlantic we took a few deep-sea soundings in 2000 fathoms and thereabouts, far from the track of the 'Challenger,' and these have furnished me with little sackfulls of globigerina ooze. On reaching the position of the Hotspur Bank, in lat. 17° 32′ S., long. 35° 46′ W., we put the dredge overboard in

35 fathoms, thereby bringing to light a mass of dead coral honeycombed by *Pholades*, and containing within its recesses a variety of Crustaceans, Annelids, Echinoderms, Algæ, &c. Our next dredging operations were over the Victoria Bank, in lat. 20° 42′ S., long. 37° 27′ W., when the principal feature was the acquisition of numerous examples of a pretty little glassy-spiculed sponge. On the 14th October, when in lat. 30° 41′ S., and one hundred miles from the Brazilian coast, we met with one of those extraordinary flights of moths so characteristic of the region. Conspicuous by their numbers and by the pertinacity with which they clung to the sails, and, in fact, to every available dry substance, was a species of large Sphinx. Of moths I captured altogether about fifteen species, and of butterflies two or three. The ship presented quite a gay appearance amid these swarms of insect-life. Owing to the rapid passages which we have hitherto made, I have had comparatively few opportunities of satisfactorily plying the tow-net. A speed of three or four knots soon wears out the net, and is, moreover, destructive of the fragile organisms sought after. I have, however, obtained a fair collection of pelagic Mollusca, minute crustaceans, and protozoa, all of which have been carefully preserved and labelled. I do not expect to meet with many birds worth preserving until we reach the inner waters of the west coast of Patagonia; but from these, as well as from the Pacific Islands, I hope to send specimens. There is a certain pair of lonely uninhabited islands in the South Pacific known as St. Felix and St. Ambrose, and which, as they lie far away from the main groups and four hundred and eighty miles from the American coast, might be expected to possess a fauna and flora exhibiting peculiarities similar to those of the Galapagos group. I am in hopes of being able to explore these islands during the southern winter of 1879—*i. e.*, when the rigour of the weather compels us to suspend our Magellan operations and proceed northward to Coquimbo. Sir J. Hooker has already pointed out to me that the flora of St. Felix is quite unknown, and that its investigation would probably prove of great interest. Any information, therefore, concerning the Natural History of those islands would, during the next year, prove most useful and interesting to me. Sir George Nares is doing his best to make everyone comfortable, and gives me every assistance in his power. I do not expect any great things in Magellan, as it is such an unproductive region, and has already been so thoroughly worked up, but in the Pacific I trust we shall have scope for much useful work."

THE ROE-DEER IN DORSETSHIRE.—In your review of 'The History of Glanville's Wootton,' by Mr. Dale (Zool. 1878, p. 461), you notice a statement of the author's that the Roe-deer is rare. This may possibly be the case, if he refers merely to the neighbourhood of Glanville's Wootton, but not to the county of Dorset. I venture to say there are no less than one hundred and twenty head in the Milton, Whatcombe and Houghton Woods, which fringe the southern side of the Vale of Blackmore from Stoke-Wake to Melcombe Park and the Grange Woods westward—the number being merely a question of preservation or non-preservation. The late Lord Dorchester, in 1800, turned out a few pairs in his woods at Milton, from whence their descendants dispersed in a marvellously short space of time, especially in a south-westerly direction—their shy, secluded habits, as might be expected, causing them to avoid the open country and move only from one neighbouring covert to another. I doubt if they have ever voluntarily crossed the broad expanse of down and arable which intervenes between these woodlands and those beyond the valley of the Piddle. About the year 1829, when Mr. Pleydell gave up his pack, after hunting Roe-deer exclusively for sixteen years, he permitted Mr. Drax to capture several deer and turn them out in the Charborough Woods. From this second centre they have increased in numbers and have wandered far and wide, from Moreton to Warmwell in the Valley of the Frome, and from Hyde to Houghton in that of the Piddle. Their extreme eastern extension at present is Lychett, and they have been met with as far west as Hook Park. Their rapid distribution over these two parallel tracts is attributable to the fecundity of the doe, which produces two and sometimes three fawns at a time; and in proportion as the area of their native home becomes insufficient to maintain the increasing numbers, they are compelled to seek fresh feeding grounds. Professor Newton writes:—"There were plenty a few years ago in Bere Wood, and though I think that of late they have been a good deal killed down just there, there are still some in that wood and in the Bloxworth woods that adjoin it and form an almost continuous wooded tract to Morden Park in the east. There are also a good many Roes in the Moreton Woods, lying to the south of the Piddle. Although the large farmers generally do not find the Roes injurious, the small holders complain of them, and I suspect destroy a good many. To this cause I attribute their comparative scarcity within the last three or four years about Bere Wood. The Roes are said to nibble the potatoe plants as they are sprouting above the ground, and so check their growth, if they do not wholly spoil the crop." Generally, however, they content themselves with browsing upon the underwood and the scanty herbage beneath. At fawning time the doe separates herself from the rest of her family, which usually consists of four or five in number, and remains secluded until her young are able to take care of themselves, which is not long, for in a fortnight they are as active and agile as the parent. Soon after her return, her offspring of the previous year usually disperse and form the nucleus of a fresh family. The bucks shed their horns in October and November; they are speedily replaced, and in February the "velvet," or rough skin which protects them in their soft state, disappears. In

December last, my son picked up two pairs of horns, which were lying together in one of the rides of a wood, and appeared to have been removed from the heads of their owners by violence, as the hair remained attached to their bases. It is probable that an encounter between two bucks occurred at this spot, and the weakened hold of the horns upon the skull yielding to the force of the charges, left the two combatants hornless. As the beams of the four horns were exceedingly bossed and deeply pitted, and the summits well antlered, they must have belonged to full-grown deer. We occasionally find a single horn in the rides, which I have attributed to the work of a Fox, as it is usually placed on an ant-hill or slight eminence, with indications of the recent presence of Reynard. It is well known the Fox and Stoat will drag their prey from the covert to an open spot and there devour it. A recently shed horn may possibly partake of the sweet scent of the deer, which, attracting the Fox, he carries it out, but on discovering his mistake leaves it to seek more palatable food. With regard to Mr. Dale's statement that the Roe-deer are coursed by greyhounds, this does occur, I know, sometimes, but only exceptionally; and indeed it cannot be otherwise, for they usually confine themselves to the large woods. When a deer has been observed to enter a small detached covert which is either unpreserved or under the control of a person who keeps a greyhound or a lurcher, the owner will have it drawn, after posting his dog at some favourable point to catch the deer as it endeavours to escape to the main covert, which, unless very close at hand, is fatal, for the greyhound is by far the fleeter of the two, and the roe is unable to double like a hare, and so elude the fatal gripe.—J. C. MANSEL-PLEYDELL (Whatcombe, Dorsetshire).

YOUNG OTTER IN DECEMBER.—On the 28th December last, Mr. T. E. Gunn, of this city, showed me a young Otter which was taken alive out of a hollow tree at Cossey, on the morning of that day. It weighed, when alive, nine ounces and a half, and measured eleven inches and a half from its nose to the tip of its tail. Its closed eyes and toothless gums showed that it was not many days, probably not many hours, old.—T. SOUTHWELL (Norwich).

STOATS AND THE LATE SEVERE WEATHER.—The severe winter seems to have had great effect on the colour of the common Stoat, *Mustela erminea*. Three specimens perfectly white, with the exception of a little brown on the upper part of the head, were brought to our birdstuffers in one week. Such specimens are occasionally met with in this neighbourhood during comparatively mild winters, but so seldom that, strange to say, neither of the persons who received those referred to remembered to have had one before.—J. GATCOMBE (Durnford Street, Stonehouse).

THE SQUIRREL IN SCOTLAND.—Mr. J. A. Harvie Brown, of Dunipace House, Larbert, N.B., writing to the 'Journal of Forestry,' states that he is at present engaged in tracing the past and present history of the Squirrel in Scotland; its former distribution there before it became extinct or nearly so; and its increase and spread, and the lines of its advance from the different centres of restoration. Localities where it has been introduced, known to him at present, are four in number—Dalkeith, Minto, Dunkeld, and Beaufort Castle, Inverness. The third he considers requires authentication, and the date of the first seems not laid down with sufficient exactitude. On any of the above points he would be glad of information, as well as of statistics of the amount of damage done in one season. Returns of the numbers of Squirrels killed on any one (or more) large estate in each county of Scotland would be desirable, and information regarding the destruction done to eggs of game or other birds, from personal and actual observation, with exact dates of first appearance at any localities in any part of Scotland, would also be interesting. The Gaelic name of the Squirrel is "fheoraig."—ED.

NOTE ON SHREWS OBSERVED IN NORFOLK.—In July, 1878, a specimen of the Lesser Shrew was captured in a tool-house at Northrepps, which is only the second Norfolk specimen of this Shrew, which, so far as I know, has been satisfactorily identified, the first having been killed at dusk, June 14th, 1874, on Sparham Heath, by Mr. Frank Norgate, and recorded by him at p. 465 of the second volume of the 'Transactions of the Norfolk and Norwich Naturalists' Society.' On December 20th, 1878, a specimen of the Common Shrew, not quite full-grown, was caught in a mouse-trap, baited with cheese and placed under the boards of the floor in a room on the second storey of Northrepps Hall—the severe cold which then prevailed having probably caused the Shrew to seek the shelter of so unusual a situation. This specimen was also remarkable for the almost black colour of its fur, both on the back and still more on the under parts, being the nearest approach that I have seen to a melanism of this species. Mr. F. Norgate kindly allows me to add to the above note two recent observations of his own. On April 30th, 1878, he saw at Coltes-hall, in Norfolk, nine Common Shrews, all full-sized with the exception of one rather small one, which had been killed by a boy, who stated that he had found them all in one hole at the bottom of an old gate-post, together with the skins of two others, which may perhaps have been killed and partially devoured by their companions. On the 18th November, 1878, Mr. Norgate saw at Sparham a black and white Shrew diving. This was probably a specimen of the typical *Sorex fodiens*, which is a much rarer animal in Norfolk, and I expect also more exclusively aquatic, than the closely allied Oared Shrew, though both races are referred to the same species in the last edition of Bell's 'British Quadrupeds.'—J. H. GURNEY (Northrepps, Norfolk).

Mortality amongst Shrews.—I think it has not yet been determined why so many Common Shrews, *Sorex araneus*, are constantly found dead on roads and foot-paths. For many years I have observed them here at all seasons; and it is a remarkable fact that so many are seen dead on foot-paths and roads. If they are as numerous in woods and tall herbage, there must indeed be an immense number of them. Perhaps some of your correspondents may be able to throw a little light upon the subject.—James Murton (Highfield, Silverdale, Carnforth).

[In the second edition of his 'British Quadrupeds,' p. 147, Mr. Bell observes:—"So many may be found at that season (early autumn) lying dead in footways, or on other bare ground near their haunts, as to have led to the belief among country people that the Shrew could not cross a public way without incurring instant death. We confess ourselves wholly unable to furnish any explanation, having failed to discover any cause of death."—Ed.]

The Mammals of Shakespeare.—Mr. Reeks has included the Sable amongst the mammals noticed by Shakespeare (Zool. 1878, p. 245), but I think the reference is a mistake. I remember reading many years ago, in a magazine article on new readings of Shakespeare that "Sabelle," in Shakespeare's time, was a colour,—"flame-coloured" or bright red,—and that the word had been derived from a certain Queen Isabelle of France who had red hair. This meaning certainly makes Hamlet's remark much more striking. To propose to wear dark fur in preference to black does not seem much of a contrast; but, if the above be correct, then his speech is strong and bitter enough:—"So long? Nay, then, let the devil wear black, for I'll have a suite of *sabelle*"—*i. e.*, bright red.—John E. Robson (Hartlepool).

[The colour which the French call "Isabelle" is a brownish yellow, the hue of unwashed linen, and is said to owe its name to the Infanta of Spain, daughter of Philip the Second, who in 1601 made a vow not to change her linen until her husband had captured Ostend. The town was not taken until 1604, by which time it is not surprising that the linen had assumed the above-named hue. An account of the incident *àpropos* of the isabelline colour of certain birds, and a portrait of the lady, will be found in the late Mr. Dawson Rowley's 'Ornithological Miscellany,' part iv., p. 264.—Ed.]

Large Rorqual on the Coast of Cornwall.—On January 28th a large Rorqual, *Balænoptera musculus*,—reported to have been floating in the channel many days previously, surrounded by a multitude of sea-birds,—was towed in by a fleet of boats belonging to the fishermen of Looe, on the coast of Cornwall, where it has since been "flinched," and its blubber boiled down for oil. Some of its dimensions were as follows:—Extreme length 64 feet

7 inches, and the circumference of the body (as well as it could be taken), immediately behind the pectoral fins, 38 feet; pectoral fins, 6 feet; and expanse of tail, 14 feet. Its belly was much inflated, and the edges of the plaits or folds thereon so eaten in holes—or, as it were, so completely honeycombed by the birds' bills—as to be in some places almost altogether obliterated. The sharp ridge on the body near the tail was also mutilated in the same manner. The longest plates of "baleen" were fully three feet; including the fringe, and of a dark slate-colour on the outer edges, striped and gradually shaded off to yellowish white on the inner edges. The back was almost black, smooth, and somewhat polished, shaded to lead-colour on the sides where meeting the cream-colour of the belly, which part was probably white before it became changed by decomposition. Arriving at Looe on the morning of the 31st, I found that the belly had unfortunately been cut open and emptied of its contents, thereby causing such a complete collapse that the proper form of the whole front part of the huge animal was entirely destroyed. My friend Mr. Clogg, of Looe, in an interesting note on the occurrence of this whale, states that the upper jaw, was from angle of mouth to tip of nose, 11 feet 6 inches in length; under jaw, 14 feet, and that the roof of the mouth was of a beautiful rose-colour, the under part being of a dull cream, marked with longitudinal lead-coloured lines about half an inch in breadth.—JOHN GATCOMBE (Lower Durnford Street, Stonehouse, Devon).

PILOT WHALE ON THE NORFOLK COAST.—On the 30th January last a specimen of the Pilot Whale was found dead on the beach between Trimingham and Mundesley, on the Norfolk coast. It was a female, and appeared not to have been dead many days. It was not a large specimen, as will be seen by the following measurements, for which I am indebted to the kindness of my friend, Mr. Thomas Southwell, of Norwich:—

Total length in straight line - - - -	13 feet	6 inches.
From the upper lip along the curve to the spring of the dorsal fin - - - -	4 ,,	8 ,,
From the anterior portion of the dorsal fin to the notch of the tail - - - -	7 ,,	4½ ,,
Height of dorsal fin - - - -	0 ,,	11 ,,
Length of flipper along the anterior edge -	3 ,,	3 ,,
Greatest breadth of flipper - - -	0 ,,	8 ,,
Breadth of tail - - - - - -	3 ,,	0 ,,
From the blow-hole to the upper lip along the curve	2 ,,	0 ,,
,, to the eye - - -	1 ,,	1½ ,,
,, to the angle of the mouth -	0 ,,	3¾ ,,

This specimen agreed with the figure in Bell's 'British Quadrupeds,' except that the upper edge of the dorsal fin appeared to be somewhat more prolonged and the posterior edge more curved. I believe that this species, *Globiocephalus melas* (Trail) has not been previously recorded from the coast of Norfolk.—J. H. GURNEY (Northrepps, Norwich).

WILDFOWL IN COUNTY MAYO.—In apparent anticipation of the severe winter, some of our migrants appeared earlier than usual this season, Wigeon being seen near Bartragh on the 22nd September, fully a fortnight earlier than last season. A Spotted Redshank visited this locality last autumn, and as I was walking along the shore, on the 22nd September, I heard it calling loudly for some time from the favourite haunt amongst the islands near Roserk Abbey. It must have left the neighbourhood shortly afterwards, for although I kept a sharp look-out I did not see or hear it again. Unless it was killed by one of the shore-shooters I do not think it would have disappeared so soon after its arrival, for those I have previously seen here generally remained for some weeks about the islands. When out in my punt near Bartragh, on the 25th October, I observed a small grebe swimming in the channel close to Baunros. I at first took it for the rare Eared Grebe, but on shooting it found it to be an immature specimen of the Sclavonian Grebe, the first example of the species I ever met with here. On the 29th October I was fortunate in obtaining from a game-dealer in Ballina three fine specimens of the Gadwall, a duck so rare in this district that it has only come under my notice twice previously. The three in question were shot the evening before near Roserk Abbey. Two of them were male and female, in the beautiful adult plumage, and the third was a young male of the year, just beginning to assume the grey wavy feathers. These birds were probably part of a flock of ten or twelve that I saw near Baunros a few days before, and which I at first took to be Pintails as they flew rapidly past and alighted on the sands. A heavy northerly gale having been blowing for some days, I went down to Enniscrone on December 30th to look out for any water-logged birds that might have been driven ashore by the storm. I found several, as I expected, namely, an old and young Gannet (the latter alive), some young Razorbills and Guillemots, and six young Puffins, some of which were alive, but so utterly exhausted that they died shortly after I picked them up. As I returned along the Moyview shore I found an adult Puffin and two Fulmars in fine plumage. The plumage of one of these was so dry, and the eyes appeared so fresh and full, that it could not have been dead more than a few hours when I found it, and had most probably drifted while still alive, though in an exhausted state, into the river with the flowing tide.—ROBERT WARREN (Moyview, Ballina).

FURTHER NOTES ON MIGRATION.—On December 17th a single wild Swan passed the Tees-mouth Buoy-lightship. On the 18th, six—namely, three mature and three immature. On the 19th, fourteen Swans, one Canada Goose, and two great Northern Divers, a large flock passed over Flamborough also on the 19th. Swans appeared in the Humber during the same week. On the 16th December a well-known punt-shooter near the Tees-mouth killed at one shot from his punt-gun, fifty Dunlins, twelve Stints (?), nine Curlews, and seven Godwits. On the following day the same man, also at one shot, killed ninety-seven Stints. On the 7th January a large flock of Brent Geese passed the Tees-mouth. From the 17th to the 20th November immense numbers of the *Limicolæ* passed Heligoland. Mr. Gätke writes:—"November up to 17th, storm from the south, evening almost calm, slight current of air from the east. At 9 P.M. *Charadrius squatarola* vel *helvetica* passing in countless numbers, not only overhead, but in a broad front extending as far as the ear could perceive the faintest sound of their call-notes, to both sides of Heligoland; direction of flight from E. to W. 29th to 30th, N.E., *Pyrrhula vulgaris*, about half a score; none seen here for many long years. Night from 19th to 20th, *Numenius arquatus*, from 3 to 6.20 A.M. The whole atmosphere one mass of these birds, the noise of their call-notes quite unearthly and bewildering; countless smaller waders mixed with them." The loss amongst the birds in this district during the severe weather in December was enormous. The fatality was especially large amongst the Thrushes and the Redwings. Great numbers of birds were frozen on the night of Christmas Eve, when the thermometer near the ground stood very few degrees below zero, with a cutting wind. As a most extraordinary illustration of the intense cold, I had the same night two sheep frozen to death. Mr. Bailey, writing from Flamborough, says:—"During the severe weather from December 8th to the 27th enormous numbers of birds perished—Thrushes, Blackbirds, Redwings, Starlings, &c. The heavy snow having driven them from the land, they daily resorted to the shore at low water, searching amongst the sea-weed for food, and amongst the refuse of fish. When the tide rose they sought any shelter they could find near the foot of the cliffs, and scores perished. Rock Doves, Wood Pigeons, Stock Doves, and Golden Plovers have all suffered greatly. Some fishermen who had been down the cliff with ropes reported great numbers of Rock Doves dead at the foot."—JOHN CORDEAUX (Great Cotes, Ulceby).

ORNITHOLOGICAL NOTES FROM SOMERSETSHIRE.—Finding myself recently in the neighbourhood of the Somersetshire Purple Gallinule (Zool. 1877, p. 178), and being anxious to ascertain its species, I called to see it, and found it to be an example of *Porphyrio veterum*, in very perfect condition. It had been very well set up by a Bristol birdstuffer. Its owner, Mr. James Burrows, of Badgworth, told me that a sheep-dog of his was extremely clever in capturing birds, especially Moorhens, and one day brought him this Purple Gallinule perfectly uninjured. It was kept alive for several days, but would not touch any food that was given to it, and was very fierce when any one approached it; it was, therefore, killed and sent to be stuffed. In a case adjoining the one which contained the Purple Gallinule was an Egyptian Goose, which had also been secured by the sheep-dog in one of Mr. Burrow's fields; but this was a wounded bird. I noticed that the country about Badgworth, and indeed the whole of the extensive flat between the Mendip and Brent Knoll, is intersected by numerous dykes, most of which are arched over by a tangled growth of bushes, and thus would form a safe retreat for Coots, Moorhens, &c., so that the Purple Gallinule may have been for some time inhabiting the district before it was captured by the sheep-dog on August 25th, 1875. Having heard a report that a farmer living on the flat had, not long since, shot a Crane, I called on him to gather what information he could give on the matter. The Great Western Railway runs through the great Mid Somerset level, and where it is crossed by lanes these approach it by artificially constructed mounds supporting the bridges over the line, locally termed "tips." All the bridges, lanes, and tips are precisely alike, and it was with some difficulty, and not until after one or two blunders, that I at last obtained the "correct tip," which brought me to Wick Farm, in the parish of South Brent, the abode of Mr. William Harris, who was reported to have shot the Crane. Finding him at home, I received from him the following information:—One evening in May, 1875, just as it was getting dusk, he saw a large bird alight in a field near his house. He went home for his gun, and returning found the bird in the same place, and succeeded in getting near enough to shoot it. It was very different to what we call the Common Crane, he said (meaning the Common Heron), and was altogether a strange-looking bird. The top of its head was red, and the feathers of its tail were like those of a cock; and he proceeded to give me a very good description of an adult *Grus communis*. Asked what he had done with the bird, he replied that not knowing it was of any value he had given it to his labourers, and that since then some of his neighbours had very much blamed him for not having had the bird preserved. That the cold weather which set in at the beginning of December would be of some continuance was announced in West Somerset not so much by the arrival beforehand, in greater numbers, of migratory birds from the north, as by the departure of nearly all the small birds that were with us at the time. Most of the Fieldfares, Redwings, Starlings, Finches, Blackbirds and Thrushes left us, and it was quite strange to wander over the fields and through the woods and to find them almost entirely deserted by birds. In a long day's shooting in a well-wooded district I only noticed three Blackbirds and one or two Robins, and did not see a single other small bird. The great majority had doubtless sought the coasts to hunt for food on the salt marshes, and many had taken a longer flight to more southern countries. The few that remained behind suffered severely. One incident of the weather was the revelation that the Water Rail, locally termed "Skitty," was a common bird with us. In all the game-shops in Taunton these birds were hanging up in bunches, and one dealer told me that he was obliged to refuse to purchase any more, not finding any sale for them. The shy and retiring Water Rail is so seldom brought to bag, and is so little known in consequence by the non-ornithological public, that I actually found one once hanging up in the bar of the Railway Hotel at Yatton, waiting for some one to say what the strange bird was. In November two birds were obtained near Taunton, in localities very different to their accustomed haunts. The first was a young Gannet, which was caught by the gardener at Monty's Court on a pond; the second a young Puffin, shot on some flooded ground on North Curry Moor. Hawfinches appeared with us with the cold weather, as they usually do. While the snow was on the ground, the turnip-fields were attacked by numerous starving Ring Doves, among which were many Stock Doves, and I found the latter to be plump and in good condition, while the former were little more than bone and feather. In North Devon, Great Northern Divers were abundant at the commencement of the frost on the Taw, as were also many other species of wildfowl. Among those obtained, I saw some very perfect examples of the mallard Goldeneye. In the very cold weather during the middle of January there were many wild swans and wild geese on North Curry Moor. Mr. Foster, of North Curry, purchased a swan shot by one of the gunners, which I find to be *Cygnus Bewickii*, and I should think an adult bird.—MURRAY A. MATHEW (Bishop's Lydeard).

ORNITHOLOGICAL NOTES FROM OXFORDSHIRE.—A Great Snipe was obtained near Bampton on the 2nd September last. I am informed that five and twenty years ago, before the commons were drained, several were procured. One also was shot at Walkworth some years back. On the 8th December, when walking through a large stubble-field, I noticed a Snow Bunting in company with two Chaffinches. It is a very rare visitant to this county. When Snipe-shooting on the 14th December I procured a fine specimen of the Green Sandpiper. It was feeding on the banks of the Swere, a rapid stream in the northern part of Oxfordshire. It is more usual to meet with this species in August or early in September. The Lesser Spotted Woodpecker is still of frequent occurrence with us. Within a week I noticed no less than three, probably all different examples, as the localities were some distance apart. This bird generally searches for food on the outer branches of trees, not on the trunk. A Water Rail was shot on December 14th, and two others were seen. A Widgeon was killed on the Cherwell on the 17th. Several large "strings" of Geese have been observed. Wild Ducks have been very numerous. It has also been a capital season for Snipe; they frequented the water-meadows in large "wisps," but Jacks have been scarce. Lapwing and Plover were plentiful, but they all disappeared before the frost set in, and have not yet returned. I have paid great attention lately to the Grey Wagtail, and I find it resident in this county throughout the year. On looking through my notes I find I noticed one or more individuals every month. It seems a very local species. I know two or three spots where it is invariably to be met with. I find Mr. A. G. More includes it in the Sub-Province 9 (Oxon, Berks, Bucks), on the authority of the Rev. B. Burgess. Although not nearly so numerous as in the breeding season, I have observed Kestrels here every day all through November and December. The Siskin and Redpoll, especially the latter, have been fairly plentiful. Ornithologists will be pleased to hear that the Goldfinch is very common with us, small flocks of this elegant bird frequenting the waste lands. In one stubble-field I saw a very large flock, containing fully eighty individuals. They are, however, scarce in the breeding season. From October to March I do not often meet with the Stonechat, but I noticed a fine male perched on the topmost spray of a furze-bush on December 4th. On November 28th I saw two Kittiwakes flying over; one had recently been killed in the vicinity. A Quail was shot here in October. I have daily noticed very large flocks of Stock Doves feeding in the stubbles. A fine male Goldeneye was shot on December 12th at Chattercut Reservoir, and a Razorbill was procured on the same day and locality. Although getting a scarce species with us, examples of the Greater Spotted Woodpecker are occasionally met with. I have recently been told of one killed in the early part of the year by a gamekeeper in Broughton Park.—C. MATTHEW PRIOR (The Avenue, Bedford).

THE PAST SHOOTING SEASON AT THE SCILLY ISLES.—The late severe winter has given a fine season of sport on these islands. The return of the number of Woodcocks and Snipes killed by the Lord Proprietor, Mr. Dorrien Smith, may interest the readers of 'The Zoologist.' The following is about the summary of the bag, but I am led to believe that double the number of Snipes might have been obtained by additional and fairly effective guns:—Woodcocks, 415; Snipes, full, 545; Jack Snipes, 73; Curlew, 10; Teal, 67; Pheasants, 390; Golden Plover, 84; Landrails, 3; Rabbits, 2045; various, between 100 and 200, including one Purple Heron (immature), one Wood Sandpiper, one Green Sandpiper, Ruffs, Bar-tailed Godwit, Goldeneye, Shoveller, Norfolk Plover, Pochards, Wild Ducks, Widgeon, in more or less numbers. The best day's Snipe-shooting gave 53½ couples, and of Woodcocks 42 birds. I need scarcely refer to the fact of the Islands having been crammed with all sorts of the Thrush tribe, as well as our indigenous birds, during the hard weather, it being always the case that in severe winters there is always more or less an immigration southward and westward of birds in search of food and shelter—a movement, of course, entirely independent of the great autumnal migratorial movement.—Edward Hearle Rodd (Penzance).

Rare Birds in Nottinghamshire.—A female King Duck was shot in November, 1877, on the Derwent, by Mr. J. H. Towle, of Draycott Hall. Mr. Harting, in his 'Handbook of British Birds,' only mentions its occurrence on fifteen previous occasions. The Spotted Crake has been very plentiful about the Nottingham meadows, where it nested last summer. One birdstuffer had fourteen and another nine of these birds, some of them quite young, sent to them for preservation. In July last I saw a Common Buzzard flying over my house. This bird is now very seldom seen in this district. A pair of Shoveller Ducks frequented the lake here all last summer, but no young ones were seen, though the place was kept very quiet. We had a dozen or more pairs of Tufted Ducks nesting round here last year, and have shot a goodly number during the present winter. Four or five pairs of Snipe also nested here. Two Little Auks were killed at Wollaton, near Nottingham, in November last, after several days of stormy weather. During the same month a Storm Petrel was killed near Nottingham. A specimen of Leach's Petrel was shot between Lenton and the Trent, towards the end of November last, by Mr. Moult, of Old Radford. So far as I am aware, this is the second instance of its occurrence in this county, the first being in 1840.—J. Whitaker (Rainworth Lodge, Mansfield).

Notes from Dublin.—The recent severe frosts have proved fatal to immense numbers of birds, but Blackbirds, Thrushes and Starlings seem to have suffered most. During the eight weeks from the end of November to the middle of January my Sunday duty took me through a considerable portion of the Dublin Mountains, and I had opportunities of noticing the effects of the very severe weather upon most of our common birds. The country in November seemed to be full of Fieldfares, but they nearly all disappeared after the first fortnight of frost, seeking, no doubt, warmer quarters farther south. Missel Thrushes also vanished. The Redwings were found in the immediate outskirts of the city; whilst flocks of Yellow Buntings, Greenfinches, and even a few pairs of Bullfinches were to be met with in the suburban gardens. Rooks on several occasions were found preying on Starlings. I thought at first that these had died from the cold, but I am assured that in some cases they were killed before they were eaten by their half-famished neighbours. Of the *Paridæ*, Blue Tits alone were common. A few flocks of wild geese and one flock of wild swans were seen and heard passing in the neighbourhood; but the absence of birds in the mountains, save round each farmstead, was very remarkable.—Charles W. Benson (Rathmines School).

Wagtails observed in Holland.—Some remarks of mine on this subject in the January number (p. 11) being apparently not quite clear, I beg to add the following explanation :—The Yellow Wagtails of Europe, although considered by Messrs. Finsch and Hartlaub (Vog. Ost. Afr.) to be merely varieties of one species, are divided by Mr. Dresser ('Birds of Europe,' pt. 40) into four, as follows, the first three being those referred to by me :—(1) *Motacilla flava*, Linn., found breeding in Central Europe; (2) *M. viridis*, Gmel., only found in the high north ; (3) *M. Raii*, Bonaparte, the well-known English summer visitor ; (4) *M. melanocephala*, Licht., inhabiting Southern Europe. Whether this last named has a similar song to the others I do not know ; but, in connection with my remarks, it is curious that Mr. Seebohm, in his notes on the Petchora birds, says of the Yellow-headed Wagtail (*M. citreola*, Pall.), "Both the call and alarm-note of this bird, as well as its low chattering song, are very similar to those of *M. viridis*." No one who has ever heard the Grey Wagtail, *M. sulphurea*, Bechst., could for a moment mistake its notes for those of *M. Raii ;* and both species are very familiar to me, as they breed abundantly in this district, the former also remaining throughout the winter.—F. S. Mitchell (Clitheroe).

Nesting of the Pied Flycatcher.—Mr. William Illingworth, bird-stuffer, of this village, but who formerly resided near Bradford, informs me that the Pied Flycatcher occasionally breeds in the valley between Thornton and Bradford. I have always considered it very remarkable since I first became acquainted with this species in Upper Wharfedale, where it breeds in great numbers [see 'Zoologist,' 1877, pp. 54, 297], that it should not be known in this part even as an accidental visitant, though the district is well wooded, in some places with fine old timber, in the vicinity of water—physical conditions which are identical with those which obtain in Upper Wharfedale, and which appear so well suited to its habits. Under the operation of the 'Wild Birds Protection Act,' which is generally respected in this neighbourhood, the breeding of the Pied Flycatcher in Airedale may be looked upon neither as an improbable nor remote contingency.—E. P. Butterfield (Wilsden).

Honey Buzzard nesting in Herefordshire.—Recently looking over the volume of the 'Zoologist' for 1877, I see that I have not recorded the nesting of a pair of Honey Buzzards in that year ; I do so now, extracting a few particulars from the notes I made at the time. The nest was built in the fork of a lofty oak in the middle of an extensive wood at Whitfield, about seven miles from this city ; it was an immense structure, from five to six feet in diameter, and was formed of sticks, some of considerable size ; it was a matter of surprise how the birds carried many of them ; the lining appeared to be composed of leaves only ; two eggs were laid. At the end of July the young ones were taken from the nest, and traps were laid for the parents; in a few days afterwards the female was taken and sent to one of our birdstuffers, where I saw it in the flesh shortly after its arrival; the upper part of the breast was a light yellowish red, the lower whitish with dark pear-shaped spots, more distinctly marked than I have previously noticed in specimens in collections; the stomach was full of wasps' comb. Although I have seen and examined numbers of the Common Buzzard during the past ten years, this is the first example of the Honey Buzzard which I have known taken here.—J. B. Pilley (2, High Town, Hereford).

White's Thrush in Berwickshire.—During the last week of September, 1878, a Thrush, supposed to be of this species, was shot by Mr. Forbes Burn at Hardacres, in Berwickshire. Not being aware of its rarity, only a portion of the bird was saved—the head and wings unskinned, with part of the skin of the breast and back—and forwarded to Mr. Brotherston, taxidermist, of Kelso, to be converted into an ornament for a lady's hat. Fortunately Mr. Brotherston took steps to try and secure what was left of it for the Kelso Museum, to which institution the owner kindly presented it. Mr. Brotherston, communicating the circumstance in a note which was published in 'Land and Water' on the first of the present month of February, remarked that the relative length of the primaries differ from the measurements given by Yarrell in his description of the specimen in Lord Malmsbury's collection. He writes—"Length of wing from carpal joint, 6⅝ inches; first feather very short, 1¼ inch; the second in the left wing is ¼ inch, and in the right about ⅛ inch shorter than the fourth. The second and fourth in Lord Malmsbury's specimen were equal. The third is the longest in the wing, being about ⅛ inch longer than the fourth Length of bill from gape one inch four lines. The marking on the head is also different. Yarrell says 'the feathers on the upper part of the head and neck, yellow-brown tipped with black.' In this specimen these feathers are black (becoming lighter on the basal half as they go backwards), with a yellow-brown spot about one-sixteenth of an inch from the tip. In other respects it agrees with his description, so far as can be seen." These variations suggest tbe idea that the bird in question may not be White's Thrush after all, but possibly an allied species of the genus. (See Prof. Newton's edition of Yärrell's 'British Birds,' vol. i., p. 255, where the distinguishing characters are pointed out.) It would be desirable, therefore, to compare the specimen in question carefully with examples of the other allied forms referred to, with a view to place its identity beyond doubt. Mr. Brotherston has since written to me to say that another bird of the kind was seen on January 19th by Mr. A. Steel, a gentleman well acquainted with all our common birds and many of the rarer ones. It was feeding on a bare sandy spot under some large willows near

Kelso Bridge. He had an excellent view of it before it took flight into Springwood Park, and, after seeing the remains of the Hardacres specimen, he is convinced that it belonged to the same species. Both birds were solitary.—J. E. Harting.

Rooks eating Small Birds.—An intelligent and trustworthy farm-servant of my uncle's tells me that he has several times lately seen Rooks (Crows he calls them) both feeding on and chasing small birds in this neighbourhood. One day he saw a Rook chasing a Blackbird, which succeeded in escaping, and he showed me the remains of a Robin which he saw a Rook devouring. I have also heard from others of Rooks having been seen eating small birds during the hard weather, but have not had any opportunity of ascertaining the truth or particulars of any of these reports. I think it is only during severe weather, when Rooks cannot get their usual kinds of food, that they have recourse to this carnivorous propensity, which I do not find alluded to in any of the standard works on British Birds. —J. E. Palmer (Lucan, Co. Dublin).

[Several communications on the omnivorous habits and carnivorous propensities of Rooks appeared in 'The Zoologist' for 1863 and 1864; see pages 8762, 8816, 8884, 8951, 9043, and 9110.—Ed.]

Cole Tit nesting in the Ground.—Mr. Young's experience (p. 32) as to the frequency of the Cole Tit choosing a hole in the ground as its nesting place is precisely in accordance with my own. In June, 1871, my dog found a nest containing young birds in the rotten stump of a Scotch fir, which had been broken off level with the ground: I found him scratching away at the hole, which I at first supposed to be that of a mouse. On the 9th June, 1873, I found another nest in exactly a similar situation near the same spot, and by the same means, viz., by seeing a dog scratching at it; this nest contained eight young birds, all of which had been drowned by a heavy rain. A third nest was placed in a fig-box nailed to the wall of the house, with a hole cut in it, and intended for the benefit of a pair of Tom-tits.—G. T. Rope (Blaxhall, Suffolk).

Great Skua near Shrewsbury.— A few months ago a tenant came to me, bringing alive in a sack a strange bird he had picked up, apparently quite exhausted, but not hurt, in one of his turnip-fields. It turned out to be the Great Brown Skua, which Mr. Henry Shaw tells me he has never seen alive in Shropshire in his time, and is very rare in any part of Great Britain. It is now quite well in my aviary, and apparently does not in the least object to company or confinement.—R. Cholmondeley (Shrewsbury).

Reeve in Dorsetshire in December.—A Reeve was caught in a snipe-trap in December last, in a water-meadow at Meltown St. Andrew's. I have another in my possession, which was shot within a mile of this spot, about ten years ago.—J. C. Mansel-Pleydell (Whatcombe, Dorsetshire).

ESQUIMAUX CURLEW IN ABERDEENSHIRE.—At a meeting of the Natural History Society of Glasgow, held on the 26th November last, Mr. J. A. Harvie Brown exhibited a specimen of the Esquimaux Curlew, *Numenius borealis,* which had been shot in Aberdeenshire on the 29th of the previous month of September. A note to Mr. Robert Mason, the Secretary of the Society, procured for me the following particulars from Mr. Sim, the taxidermist, of King Street, Aberdeen, to whom the specimen was sent for preservation:—"The bird was shot by Mr. Ramsay, of Staines, and proved to be a male, weighing eight ounces. The total length from tip of bill to end of tail was 13½ inches; expanse of wings 25¾ inches; bill 2 inches, wing from carpal joint 7⅞ inches, and tarsus 1¾ inch. The stomach contained crowberries, some flies, and a caterpillar." This rare straggler from America was first noticed as a visitor to the British Islands in 1855, when one was killed in Kincardineshire, as recorded by Mr. Longmuir ('Naturalist,' 1855, p. 265), and subsequently in Yarrell's 'History of British Birds' (3rd ed., vol. ii., p. 620). Two were subsequently shot in Suffolk, as noticed by Mr. Hele in his 'Notes about Aldeburgh' (p. 177), and a fourth, purchased in Dublin in the flesh, in October, 1870, is preserved in the collection of Sir Victor Brooke (see 'Zoologist,' 1870, p. 2408). The specimen now referred to therefore makes the fifth which has been procured in this country.—J. E. HARTING.

GROUSE QUITTING THE MOORS IN YORKSHIRE.—A pair of Grouse were seen in a turnip-field on our farm early in February. This is the only instance of the kind that has occurred for a very long period, and seems to indicate an absence of food in their usual haunts. We are ten miles from the nearest grouse moor.—WALTER STAMPER (Highfield House, Oswaldkirk, York).

WRENS ROOSTING.—Noticing one evening several Wrens coming to roost in the ivy during the excessive cold of this winter, I went towards dusk to the spot, and there in a hole in some honeysuckle and ivy stems I found no less than fourteen of these little birds congregated together, no doubt for the purpose of keeping each other warm.—HENRY G. TOMLINSON (The Woodlands, Burton-on-Trent).

CURIOUS HAUNT FOR A SNIPE.—On the 24th December last a carpenter, in the village of Killashandra, on entering an old uninhabited house used occasionally by him as a workshop, was surprised to see a Snipe flying about. It was found to be rather thin, evidently having taken up its quarters there owing to the severity of the weather.—W. J. HAMILTON (Castle Hamilton, Co. Cavan).

GLAUCOUS GULL AT ALDEBURGH.—A fine specimen of the Glaucous Gull was brought to me on January 25th. It was shot at Thorpe Mere, where it was feeding in company with a flock of Common Gulls.—F. M. OGILVIE (Sizewell, Leiston).

HAWFINCH IN IRELAND.—On the 13th November a specimen of the Hawfinch (*Coccothraustes vulgaris*) was brought to me. It was found lying dead on one of the garden walks near a lime tree. It was a young male, in good condition, and the plumage perfect.—W. J. HAMILTON (Castle Hamilton, Co. Cavan).

[The Hawfinch is included by Thompson amongst the birds of Ireland as an occasional visitant.—ED.]

GREAT GREY SHRIKE IN YORKSHIRE.—On the 11th January last, whilst standing upon the platform at Shipley Station, my brother and I observed what we had little doubt was a Grey Shrike fly over the metals to the south of the Station. This is the second occurrence in this part within the last few years. The first example was shot in the Goitstock Valley, and is now in the possession of Mr. P. Dalton, Bingley. On the 1st February last I saw a Mealy Redpoll, in company with Lesser Redpolls and Siskins, feeding upon the seeds of the alder by the side of the River Aire. Of course there might have been more than one specimen, but I did not get near enough to identify any more with certainty.—E. P. BUTTERFIELD (Wilsden).

CLOSE-TIME FOR FRESH-WATER FISH.—In the month of August, 1878, an Act was passed having for its object the appointment of a close-time for such fresh-water fish as were not already protected by previous Statutes. This Act, which is entitled 'The Freshwater Fisheries Act, 1878,' will come into operation for the first time during the present spring, and its principal provisions are as follows:—The close-time appointed is *between the 15th day of March and the 15th day of June, both inclusive.* The term "fresh-water fish" includes all kinds of fish (other than Pollan, Trout and Char) which live in fresh water, except those kinds which migrate to or from the open sea. If any person during this close season fishes for, catches, or attempts to catch or kill any fresh-water fish in any river, lake, tributary, stream, or other water connected or communicating with such river, he shall, on summary conviction before two justices, be liable to a fine not exceeding forty shillings. This, however, does not apply (*a*) to the owner of any several or private fishery where Trout, Char or Grayling are specially preserved, destroying within such fishery any fresh-water fish other than grayling; (*b*) to any person angling in any several fishery with the leave of the owner of such fishery, or in any public fishery under the jurisdiction of a board of conservators with the leave of the said board; (*c*) to any person taking fresh-water fish for scientific purposes; (*d*) to any person taking fresh-water fish for bait. Buying, selling, or exposing for sale fresh-water fish during the close season is declared illegal under a penalty not exceeding, for a first offence, 40s., and for a second offence, £5:

the person or persons convicted forfeiting all fish caught, bought, sold or exposed for sale, and (at the discretion of the convicting justices) all instruments used in the taking of such fish; the justices having the power also, upon information on oath, to authorise the search of any suspected premises. Sundry clauses which by the Salmon Acts render certain modes of fishing illegal, are introduced, as well as regulations relative to licenses, water-bailiffs, &c. The counties of Norfolk and Suffolk, which are already protected by a Freshwater Fisheries Act, are exempted from the operation of certain clauses in the present one.—ED.

PROCEEDINGS OF SCIENTIFIC SOCIETIES.

LINNEAN SOCIETY OF LONDON.

February 6, 1879.—Prof. ALLMAN, F.R.S., President, in the chair.

Several interesting exhibitions and remarks, chiefly on vegetable products, were made, the only one of zoological interest being that of Mr. R. Irwin Lynch, namely, parts of the bull's-thorn acacia and imbauba tree, as also a couple of orchids, all exemplifying the economy of those plants in affording protection to and food for ants.

A short paper, "On the position of the Genus *Sequenzia* among the Gasteropoda," was read by Dr. Gwyn Jeffreys. Herein he expressed an opinion differing from that lately promulgated by the Rev. R. Boog Watson, believing that this mollusk belongs to the Solarium group rather than to the Trochus family, in which the latter naturalist had placed it.

Sir John Lubbock then read two papers "On Ants." The first was devoted to an account of their anatomy, the muscular system being more particularly described, as elucidated by microscopical sections, &c., these being accompanied by an extensive series of drawings. The second paper was a continuation of his observations "On the Habits of Ants." He observed that he had at first isolated his nests by means of water. This was effectual enough, but, especially in summer, the water required to be continually renewed. Kerner, however, had suggested that the hairs of plants served to prevent ants from obtaining access to the honey, and it accordingly occurred to him that strips of fur arranged with the points of the hairs downwards might answer his purpose. He had tried this, and, finding it successful, he thought a similar arrangement might perhaps be found useful in hot countries. It is generally stated that the queen ants alone lay eggs, but Sir John has found that in most of his nests some few of the workers are capable of doing so. It appears, however, that these eggs always produce males. In the case of bees we know that the queen is ed on a special kind of food. In ants it is not feasible to make observations similar to those by which in bees this has been established. It is, however, rendered more than probable by the fact that, while males and workers have been bred by hundreds in his nests, no queen has yet been produced. M. Lespès has given a short but interesting account of some experiments made by him on the relations existing between ants and their domestic animals, from which it might be inferred that even within the limits of a single species some communities are more advanced than others. He found that specimens of the curious blind beetle, *Claviger*, which always occurs with ants, when transferred from a nest of *Lasius niger* to another which kept none of these domestic beetles, were invariably attacked and eaten. From this he infers that the intelligence necessary to keep Clavigers is not co-extensive with the species, but belongs only to certain communities and races, which, so to say, are more advanced in civilization than the rest of the species. Sir John Lubbock, however, removed specimens of the curious blind *Platyarthrus* from one nest to another, but they were always amicably received. He even transferred specimens from a nest of *Lasius flavus* to one of *Formica fusca*, with the same result. As regards the longevity of ants, he has now two queens of *F. fusca* which seem quite in good health, and which have lived with him since 1874; they are, therefore, probably five years old. He has also workers of *L. niger*, *F. sanguinea*, *F. fusca* and *F. cinerea*, which he has had under observation since 1875. In his previous papers he has given several instances which seem to show that ants do not exhibit such unvarying kindness to their friends as has been usually supposed. He wished, however, to guard himself against being supposed to question the general good qualities of his favourites. In fact, ants of the same nest never quarrel among themselves; he had never seen any evidence of ill-temper in any of his nests. All is harmony. He had already in previous papers given various instances of tender kindness. Again, in one of his nests of *Formica fusca* was a poor ant which had come into the world without antennæ. Never having previously met with such a case, he watched her with great interest, but she never appeared to leave the nest. At length, one day he found her wandering about in an aimless sort of manner, and apparently not knowing her way at all. After a while she fell in with some specimens of *Lasius flavus*, who directly attacked her. He then set himself to separate them; but she was evidently much wounded, and lay helpless on the ground. After some time another *F. fusca* from her nest came by. She examined the poor sufferer carefully, then picked her up tenderly and carried her away into the nest. It would have been difficult, Sir John thinks, for any one who witnessed this scene to have denied to this ant the possession of human feelings. It is clear, from the experiments recorded in the present and in Sir John's former papers, that the ants recognise all their fellows in the same nest, but it is very difficult to understand how this can be effected. The nests vary very much in size, but in some species 100,000 individuals may probably be by no means an unusual number, and in some instances even this is largely exceeded. Now, it seems almost incredible that in such cases every ant knows every other one by sight; neither does it seem possible that all the ants in each nest should be characterized from those of other nests by any peculiarity. It has been suggested in the case of bees that each nest might have some sign or pass-word. The whole subject is full of difficulty. It occurred to Sir John, however, that experiments with pupæ might throw some light on the subject. Although the ants of every nest, say of *Formica fusca*, are deadly enemies to others, still if larvæ or pupæ from one nest are transferred to another they are kindly received, and tended with, apparently, as much care as if they really belonged to the nest. In ant warfare, though sex is no protection, the young are spared—at least, when they belong to the same species. Moreover, though the habits and dispositions of ants are greatly changed if they are taken away from their nest and kept in solitary confinement or only with a few friends, still in such circumstances they will carefully tend any young which may be confided to them Now, if the recognition were effected by means of some signal or pass-word, then, as it can hardly be supposed that the larvæ or pupæ would be sufficiently intelligent to appreciate, still less to remember it, the pupæ which were entrusted to ants from another's nest would have the pass-word, if any, of that nest, and not of the one from which they had been taken. Hence, if the recognition were effected by some pass-word or sign with the antennæ, they would be amicably received in the nest from which their nurses had been taken, but not in their own. He therefore took a number of pupæ out of some of his nests of *Formica fusca* and *Lasius niger* and put them in small glasses, some with ants from their own nest, some with ants from another nest of the same species. The results were that thirty-two ants belonging to *F. fusca* and *L. niger*, removed from their nest as pupæ, attended by friends and restored to their own nest, were all amicably received. What is still more remarkable, of twenty-two ants belonging to *F. fusca*, removed as pupæ, attended by strangers, and returned to their own nest, twenty were amicably received. As regards one, Sir John was doubtful; this last was crippled in coming out of the pupa-case, and to this perhaps her unfriendly reception may have been due. Of the same number of *L. niger*, developed in the same manner, from pupæ tended by strangers belonging to the same species, and then returned into their own nest, seventeen were amicably received, three were attacked; about two Sir John felt doubtful. On the other hand, fifteen specimens belonging to the same two species, removed as pupæ, tended by strangers belonging to the same species, and then put into the strangers' nest, were all attacked. The results may be summarised as follows:—Pupæ brought up by friends and replaced in their own nest—attacked, 0; received amicably, 33. Pupæ brought up by strangers and put in own nest—attacked, 7 (about three of these Sir John did not feel sure); received amicably, 37. Pupæ brought up by strangers and put in strangers' nest—attacked, 15; received amicably, 0. Sir John intends to make further experiments in this direction, but the above results seem very interesting. They appear to indicate that ants of the same nest do not recognise one another by any pass-word. On the other hand, if ants are removed from a nest in the pupæ state, tended by strangers, and then restored, some at least of their own relatives are certainly puzzled, and in many cases doubt their claim to consanguinity. Strangers under similar circumstances would be immediately attacked. These ants, on the contrary, were in every case—sometimes, however, after examination—amicably received by the majority of the colony, and it was often several hours before they came across one who did not recognise them.—J. Murie.

Zoological Society of London.

February 4, 1879.—Dr. Günther, F.R.S., Vice-President, in the chair.

The Secretary read a report on the additions that had been made to the Society's Menagerie during the month of January, 1879, and called special attention to a Bar-winged Rail, *Rallina pœciloptera* (Hartlaub), from the Fiji Islands, acquired by purchase; and to a young male Giraffe, *Camelopardalis giraffa*, received on deposit.

Mr. Sclater exhibited and made remarks on a specimen of a Curassow, belonging to the Royal Museum of Copenhagen, which he had received from Prof. J. Reinhardt for examination, and which Prof. Reinhardt had proposed to refer to a new species, *Mitua Salvini.*

Mr. R. Bowdler Sharpe exhibited a series of Bulwer's Pheasant, *Lobiophasis Bulweri*, from the Lawas River, N.W. Borneo, collected by Mr. W. H. Treacher, Acting Governor of Labuan. The series represented every stage of plumage of this Pheasant, and conclusively proved that *L. castaneicaudatus*, Sharpe, was the immature male of *L. Bulweri.*

A communication was read from Prof. A. H. Garrod, containing some notes on certain points in the anatomy of the Hoatzin, *Opisthocomus cristatus.*

Mr. Sclater read some notes on the breeding of the Argus Pheasant and other *Phasianidæ* in the Society's Gardens.

A communication was read from the Rev. O. P. Cambridge, containing the description of a new genus and species of Spiders, proposed to be called *Fritzia Muelleri.*

Mr. W. Ottley read the first part of a series of observations on the structure of the eye-muscles in the Mammalia.

A communication was read from Mr. Osbert Salvin on some birds transmitted by the Rev. Thomas Powell from the Samoan Islands, amongst which were two new species proposed to be called *Pinarolestes Powelli* and *Fregetta mœstissima.*

A communication was read from Mr. W. H. Dall, containing remarks on the use of the generic name *Gouldia* in Zoology.

Mr. George A. Shaw read notes upon the habits of four species of Lemurs, specimens of which had been brought alive to England, in 1878, from the province of Betsileo, in Central Madagascar.

A communication was read from Mr. F. Moore, containing descriptions of some new Asiatic Diurnal Lepidoptera.

Dr. A. Günther pointed out the characters of a new Rodent from Medellin, U.S. of Columbia, for which the name *Thrinacodus albicauda* was proposed.

February 18, 1879.—Prof. W. H. Flower, LL.D., F.R.S., President, in the chair.

The Secretary exhibited, on behalf of the Rev. T. O. Morris, an example of *Bombyx quercus* with malformed antennæ.

Mr. Sclater exhibited a new Humming Bird from Northern Peru, which he had received for identification from M. L. Taczanowski, and which he proposed to name *Thaumatius Taczanowskii.*

Mr. Sclater exhibited a living Amphisbænian (*Bronia brasiliana*), lately received by the Society from Monte Video.

A communication was read from Mr. E. L. Layard, containing a note on *Pachycephala icteroides*, Peale, with the description of a supposed new species of the genus from Ovalau, Fiji group, proposed to be called *P. neglecta.*

A communication was read from Dr. A. Günther, containing a description of four new species of Chameleons from Madagascar, proposed to be called *C. malphe, C. brevicornis, C. gularis* and *C. globifer.*

A communication was read from Mr. Edgar A. Smith, containing a description of a large collection of Mollusca from Japan, formed by Captain H. C. St. John, R.N., of H.M.S. 'Sylvia.'

Messrs. Godman and Salvin read descriptions of a number of new species of butterflies from Central and South America. A second communication from the same authors gave an account of a collection of butterflies, made by the Rev. G. Brown in New Ireland and New Britain; and Mr. A. G. Butler gave an account of the Heterocera contained in a collection from tho same locality.

A communication was read from Mr. W. A. Forbes on the systematic position of the genus *Lathamus*, in which, from a study of its pterylosis, osteology, and other points in its external and internal structure, he showed that this Parrot must be referred to the neighbourhood of the *Platycercidæ.*

Mr. R. Bowdler Sharpe read a note on *Heliodilus Soumagnei*, Gradidier, of which a specimen had recently been acquired by the British Museum. Mr. Sharpe likewise pointed out the characters of a second species of the genus *Dromæocercus*, from Madagascar, proposed to be called *D. Seebohmi.*

A communication was read from Mr. A. Boucard, containing descriptions of two supposed new species of South American birds.

Dr. F. Day read some remarks on the occurrence at Southend of the Little Gurnard, *Trigla pœciloptera*.—P. L. SCLATER, *Secretary*.

ENTOMOLOGICAL SOCIETY OF LONDON.

February 5, 1879.—Sir JOHN LUBBOCK, Bart., M.P., V.-P.R.S., &c., President, in the chair.

Mr. H. J. Elwes exhibited a collection of Lepidoptera from a small island at the mouth of the Amoor River, in Siberia.

Mr. C. O. Waterhouse exhibited a specimen of *Gasteracantha Cambridgei*, a remarkable spider from West Africa, recently described by Mr. A. G. Butler.

Mr. G. C. Champion exhibited a specimen of *Harpalus oblongiusculus*, taken by Mr. J. T. Harris, in May last, at the Chesil Bank, Weymouth.

The Secretary read a note from Mr. A. H. Swinton, calling attention to a passage in a paper by Mr. Wood-Mason, published in the last part of the Society's 'Transactions' (part iv., p. 265), wherein the author asks, "How is it that nobody has ever heard the *Mantidæ* stridulate?" Mr. Swinton referred to Kirby and Spence's 'Introduction to Entomology' (7th ed., p. 493), where it is stated, on the authority of M. Goureau, that *Mantis religiosa*, "when alarmed and having put itself in an attitude of defence, rubs the sides of the abdomen against the interior borders of the wings and elytra, so as to produce a noise like that of parchment rubbed together."

The Rev. A. E. Eaton remarked, *apropos* of the homologies of wing-nervures (see Proc. Ent. Soc., 1878, p. lvi.), that in the anterior wings of most of the *Ephemeridæ*, three primary groups of longitudinal nervures could be distinguished, the foremost proceeding directly from the thorax; the hindermost issuing from, or terminating in, a curved or angulated prominent fold interjacent between the first group and the hinder part of the base of the wing close to the wing-root; and an intermediate group which does not attain to the thorax, but either terminates in the wing-membrane close to the base of the wing, or is annexed to the hinder veins of the first group. The equivalents of the intermediate group in their ultimate ramifications constitute the "apical forks" of Mr. M'Lachlan's system. Mr. Eaton exhibited drawings of wings of Trichoptera and Tineina, in which the three groups of nervures were distinguished by colour, and the "apical forks" were shaded and numbered, in correspondence with their homologies.

Mr. Meldola communicated the following note on a remarkable case of mimicry observed by Dr. Fritz Müller:—"I have just reared from the caterpillar state ten specimens (being five males and five females) of *Eueides pavana*. This is one of our rarest butterflies, and I think I have not yet caught more than half-a-dozen, all of which were females. These resemble *Acræa Thalia* so closely that before they are caught they can be distinguished only by the club of the antennæ being yellow, while it is black in *Acræa*. Now in the male of *Eueides pavana* the club of the antennæ is black also, and this has no doubt been the cause of my never catching any male. I know of no other case in which the males of a mimicking butterfly resemble more closely the mimicked one than the females do, while the inverse is well known to be of rather frequent occurrence."

Mr. A. G. Butler communicated a paper "On the Lepidoptera of the Amazons collected by Dr. James W. H. Trail during the years 1873 to 1875. Part iii., Noctuites."

Mr. C. O. Waterhouse communicated a "Description of a new Genus and Species of Rhyncophorous Coleoptera allied to *Sipalus* found in an Orchid-house."

Mr. F. Moore communicated "Descriptions of the Species of the Lepidopterous Genus *Kallima*."

Part iv. of the 'Transactions' for 1878 was on the table; as were also copies of the President's Anniversary Address delivered at the last Meeting, for distribution.—R. Meldola, *Hon. Secretary*.

NOTICES OF NEW BOOKS.

Wanderings in South America. By Charles Waterton. New Edition, with Biographical Introduction and Explanatory Index, by the Rev. J. G. Wood. With one hundred illustrations. London: Macmillan & Co. 1879.

So many years have elapsed since the last edition of this very entertaining book was published, and second-hand copies have become so difficult to procure, that the appearance of the handsome new edition just issued by Messrs. Macmillan is as well-timed as it is welcome. If the illustrations which it contains are not invariably accurate, we must at least admit that as regards type and paper the volume is in every way worthy of the subject matter of the work, and of the well-known house from which it emanates. Whether or not a more competent editor than the Rev. J. G. Wood might have been found we will not say; at all events, it does not appear that Mr. Wood has ever visited the countries in which the author of the 'Wanderings' so long sojourned, nor can he, as his editorial notes sufficiently testify, have made more than a very superficial study of the South American fauna and flora. To say that he has exercised a very wise discretion in leaving the 'Wanderings' "untouched as Waterton wrote them," keeping his own notes quite distinct in an "Explanatory Index," is perhaps the highest compliment we can pay him. We certainly cannot congratulate him in every case upon the success of his identification of the species which Waterton described by their native names, although, as he tells us in his Preface, he has had the assistance, as regards the birds mentioned, of the Secretary of the Zoological Society. From what we know of Mr. Sclater's valuable publications on the subject of South American Ornithology, we feel sure that had Mr. Wood consulted him a little oftener he would have done so with advantage, and would have been enabled to avoid many of the errors into which he has fallen. A naturalist who has not made any special study of South American animals might be excused if he failed occasionally to identify with certainty from Waterton's description the species of a genus containing several closely-allied forms; but we hardly expected to find Mr. Wood committing so great a blunder as to discover in Guiana and Demerara Old-World species like *Pelecanus onocrotalus* (p. 451) and *Platalea leucorodia* (p. 742), which, in the New World are quite unknown; while he evinces so little knowledge of the geographical distribution of animals as to assert that "only two species of Tapir survive—one in Tropical America, and the other in Malacca and Sumatra" (p. 474). We were under the impression that there are at least three distinct species of Tapir in South America alone, two of which may be seen at any time by visiting the Zoological Society's Gardens in the Regent's Park. And here we may remark that the editor of the 'Wanderings' would not have written irrelevantly if he had directed attention to the great utility and value of a menagerie like the one referred to, in making us acquainted with the external forms and relationships of the wild animals of our own and other countries. To give another illustration: The first native name employed by Waterton which necessitates a reference to Mr. Wood's "Explanatory Index" is *Maroudi* (p. 17). On seeking an explanation we find, at p. 434, the statement that "there are several species of Maroudis, those which are best known being the Common Maroudi (*Penelope cristata*) and the Whiteheaded Maroudi (*Penelope pipile*)." We venture to think that it would have been much more to the purpose had Mr. Wood stated that the Maroudis are more familiarly known under the name "Guan," that they are closely related to the Curassows, and that several species of both may be seen any day in the Zoological Society's aviaries.

We do not know from what source Mr. Wood has borrowed his nomenclature, but the scientific names which he employs certainly do not represent the views of the best authorities at the present day, or we should not find the generic names *Brachyurus*, instead of *Pithecia*, for the Bisa Monkey (p. 374); *Arapunga*, instead of *Chasmorhynchus*, for the Bell Bird (p. 380); and *Uropsophus*, instead of *Crotalus*, for the familiar Rattlesnake (p. 465).

It does not seem to have occurred to the editor of the 'Wanderings' that in the 'Proceedings of the Zoological Society,' and in 'The Ibis,' he might have found numerous valuable papers on South American Ornithology which would have materially assisted him in his labours, while Messrs. Sclater and Salvin's "Nomenclator Avium Neotropicalium" would have furnished him with the correct names of the species identified. We will mention one article out of many which, in our opinion, ought not to have been overlooked, namely, that by Mr. Osbert Salvin "On the Costa Rican Bell Bird and its Allies" ('Ibis,' 1865, p. 90), while on the same subject he might have consulted with advantage Mr. E. C. Taylor's remarks ('Ibis,' 1864, p. 88), and those of Mr. Sclater in the volume for 1866 of the same periodical (p. 406). A reference to these sources of information under the head of "Campanero," (p. 180) would have been both appropriate and useful.

It should not be forgotten that the observations recorded by Waterton were made by him between the years 1812 and 1824, and therefore to attempt, in 1879, to elucidate his remarks without any reference to the labours and publications of the well-known writers on South American Zoology who have come after him, is to exhibit a carelessness which, in so practised a writer as Mr. Wood, is inexcusable.

We regret to have thus to express our disappointment in the result of his labours in the present instance, but, while we are grateful to the publishers for having placed in our hands so elegant a text of a truly delightful book, candour compels us to express the opinion that the natural history portion of Waterton's 'Wanderings' has yet to receive a more adequate and useful treatment than that which it has met with at the hands of Mr. Wood.

Sketches of the Wild Sports and Natural History of the Highlands. By Charles St. John. A new Edition. London: John Murray. 1878. Crowu 8vo.

Few of our readers, we imagine, are unacquainted with the writings of the late Charles St. John, who, combining the tastes of a sportsman with the acquirements of an observant naturalist, has bequeathed to posterity some of the most instructive and agreeably written essays on Sport and Natural History ever published in the English language.

Apart from the pleasant unaffected style in which his experiences are detailed, one great charm about his books is that they contain no statement for the truth of which he was not personally able to vouch. "I have been particularly careful," he says, "to describe and note down nothing, the authenticity of which I am not certain of. I have carefully avoided the great error of taking things on hearsay. In the very few instances in which I have been obliged to depend on the eyes of others, I have been careful to guard against being knowingly or unknowingly deceived. A book of this sort should be a book of reference, and as such to be thoroughly depended on; and I can assure my readers that they may fully depend on the truth and correctness of everything here mentioned."

These remarks occur in the preface to the author's "Natural History and Sport in Moray," and show very clearly his views of the duty of a naturalist. They apply with equal justice to the book before us.

Those who are familiar with the earlier edition of this work, which appeared some twenty years ago in a smaller and less important form, will welcome the appearance of this new edition, which, from its size and the beauty of the illustrations and type, forms a more fitting memorial of the deceased naturalist than has yet been produced.

As regards the illustrations, great pains seem to have been taken to enter into the spirit, and, where possible, to depict the actual scene of the events described in the text. We may particularly notice "Fishing by Moonlight" (p. 8), "Rapids on the Findhorn" (p. 74), "Across Cromarty Bay" (p. 148), "Dulsie Bridge" (p. 221), and "Swans in the Bay" (p. 235). The portrait of the Wild Cat at page 44 cannot be commended, being unfortunately not in the least like one, and we speak advisedly, having before us, as we write, a well preserved specimen of this animal which was shot on the north side of Loch Ness. The Roebuck on page 21 would look much more natural if it were not so white; for although an albino Roe is not absolutely unknown, it is sufficiently rare to preclude its being figured as an ordinary variety of this graceful animal. If we are not mistaken a white Roe, shot near Luss, on Loch Lomond, is preserved in the collection of Sir James Colquhoun.

The Long-eared Owl (p. 75) and the Kestrels (p. 112) strike us as being very delicately and naturally drawn. although we must demur to the dark cheek-patch on the Kestrel, which causes it to look too much like a Peregrine. But we are not disposed to criticise too closely a production upon which such evident pains have been bestowed both by artist and engraver. Of the letterpress we cannot speak too highly. Sportsmen and naturalists have alike tested its merits by the light of their own experience, and although few perhaps have enjoyed such opportunities for studying Nature amid some of the wildest scenery as Charles St. John, those who may peruse his writings cannot fail to perceive the extreme accuracy of his observations, and the charm of a style which always instructs while it never wearies.

Shooting Adventures, Canine Lore and Sea-fishing Trip. By "WILDFOWLER." London: Chapman & Hall. 1879. 2 vols. 8vo.

THOSE of our readers who have perused the two former volumes by "Wildfowler" will have discovered that he is no stay-at-home sportsman who draws upon his imagination for a theme to dwell upon. He is never happy unless wandering in search of sport, be it with gun, rod, or deep-sea line, not only in this our "sea-girt isle," but in any part of the European continent which may seem to promise occupation to an enthusiastic gunner and fisherman. The two volumes before us may be described as "a third series" of his former works,* for although the title has been slightly, and, as we think, unnecessarily, altered in each series, the scope and plan of the book are much the same, and the 'Adventures' here narrated do not differ in kind from the 'Trips' with which he has on former occasions made us acquainted.

To say that there is much novelty in the subjects dealt with would be misleading, for those of our readers who delight in shooting and fishing will find in many of the chapters merely an echo of their own experience, and little is related which might not happen, and no doubt has happened frequently, to most sportsmen. We must admit, however, that in some of the chapters we find exceptions to this; such for instance as "Peculiar Duck Shooting on the River Saone" and "Netting Black Ducks at Cape Grisnez." In the former of these two chapters the author describes a mode of shooting wild ducks at night, which he saw practised in France, where the birds were approached in a *bachot*, or large flat-bottomed punt, painted black, and with sides which "rose about a yard above the stream" to conceal the guns. A pot of congealed grease, with a handful of tow stuck in it for a wick, is placed in a copper-pan and rigged to the end of a bowsprit about ten feet long; a reflector being placed between the light and the boat, by which means the light is projected forward, and the gunners behind remain in comparative darkness. The light appears to exercise an extraordinary fascination over the fowl, which, instead of taking to their wings in alarm, swim towards the boat with every sign of curiosity, and pay the penalty as soon as they are within range. This can scarcely be called a sportsman-like practice; and, beyond the novelty which it presents to those who witness it for the first time, has nothing to recommend it to any save those who, being dependent on their guns for a living, are not particular how they proceed so long as the fowl are secured for the market. Hardly less objectionable is the mode of netting black ducks (Scoters and Scaups) which is said to be employed by the fishermen at Cape Grisnez; although, as in the former case, it has a certain amount of attraction for those who see it practised for the first time. It consists in driving into the sands at low-water a number of stakes enclosing a pretty large parallelogram of ground covered as much as possible with mussels and other shell-fish. To the tops of these stakes a net is fixed in such a manner as to have its flat surface parallel with and about two feet from the bottom. At high-tide this net is covered, and the black ducks, which come shoreward for the shallower water where they can reach food, on diving down for it, became entangled in the meshes of the net and are drowned. A longer and narrower net set up edgewise, as for fish, and forming a sort of semicircle beyond the flat net, prevents any dead birds that may be washed off the flat net by the action of the tide from floating out to sea. In this manner a score of ducks have been taken at a time. The device, however, is not a new one. The late Mr. Lloyd, in his 'Game-birds and Wildfowl of Sweden and Norway' (pp. 367, 368), describes a somewhat similar mode of netting wildfowl; and Mr. J. H. Gurney, Jun., in his 'Rambles of a Naturalist,' has a chapter entitled "Netting Sea-birds on the Wash." Many of our readers will no doubt recollect also Mr. Stevenson's remarks on this subject in the second volume of his 'Birds of Norfolk' (pp. 376, 377).

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* A notice of the "Second Series" appeared in 'The Zoologist,' 1878, p. 145.

Perhaps the most extraordinary capture of wild ducks in a net is that related by Daniel in the Supplement to his 'Rural Sports' (p. 627). A fisherman near Drumburgh placed a flounder-net in the river Eden, which is subject to the flux and reflux of the tide, and on his returning to take up his net, instead of finding fish, he found it loaded with wild ducks. During his absence a "fleet" of these birds had alighted below the net, and, on the flowing of the tide, were carried, from the contraction of the channel, with great impetuosity into the net and drowned. He caught one hundred and seventy Golden-eyes!

Amongst other chapters in the present volumes, which we doubt not will possess an interest for many readers, may be mentioned—"Twirling for Larks on the Continent," and "Boar and Wolf-hunting in France." It would not be easy, however, to find a better account of Wolf-hunting in France than that which is given by Col. Thornton in his 'Sporting Tour in France,' a work with which "Wildfowler" ought to make himself acquainted.* Of his own book we have probably said enough to convince those of similar tastes that they will find a good deal to amuse them in these reminiscences of our enthusiastic sportsman.

English Folk-Lore. By the Rev. T. F. THISELTON DYER, M.A., London: Hardwicke & Bogue. 1878. Post 8vo.

ACTUATED apparently by the impulse which, a year ago, prompted the formation of an English Folk-Lore Society, Mr. Dyer has sent forth the pleasantly-written little volume before us. We are candidly told in the Preface that it is not intended to be exhaustive, but has been written with a view of giving the reader information in a popular form about some of those superstitions that still linger on here and there throughout the country. There is no doubt that considerably more might be written on the subject, and has been written in scattered volumes, than is contained in the present work, but we are none the less grateful for the instalment here presented to us.

The chapters with which we are chiefly concerned are those on Birds (chap. iii.), Animals (chap. iv.), and Insects and Reptiles (chap. v.). Birds are in most countries the subject of a very varied folk-lore, and the superstitious and credulous have generally discovered in their movements omens and prognostications of coming events. It is often extremely difficult to trace superstition of any kind to their source; but those connected with birds, like all others, no doubt have frequently originated in isolated occurrences. Thus, in ancient times, if a certain bird was seen to fly over a city just before a calamity of any kind, it was ever after regarded as a bird of ill-omen and shunned as such.

Amongst the birds noticed by Mr. Dyer the Cuckoo receives the most attention, and many popular legends concerning it are given. Most of these are well known, and need not be quoted here. We may remark, however, that Mr. Dyer does not always give the best version of the rhymes quoted by him: a single instance will suffice. We give Mr. Dyer's lines first, and append the better known version :—

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* 'A Sporting Tour through various parts of France in the year 1802: including a Concise Description of the Sporting Establishments, Mode of Hunting and other field-amusements as practised in that country.' 2 vols. 4to. 1806.

In April
The Cuckoo shows his bill;
In May
He is singing all day;
In June
He changes his tune;
In July
He prepares to fly;
In August
Fly he must

In April
Come he will;
In May
He sings all day;
In June
He changes his tune;
In July
He prepares to fly;
In August
Go he must.

The lines to the Nightingale (p. 72) beginning

> "Every thing did banish moan
> Save the Nightingale alone,"

and referring to the popular notion that the mournful notes of this bird are produced by its leaning against a thorn while it sings, although attributed by Mr. Dyer, like others before him, to Shakespeare, and included in most editions of his poems, were written, it is believed, by Richard Barnefield, in 1598, and published by him in a work entitled 'Poems in divers Humours.'*

When quoting Andrew Boord to the effect that "in the Forest of St. Leonards in Southsex there doth never singe nightingale;" that "they wyl singe round about the Foreste and never within the precincte of the Forest," Mr. Dyer might have referred also to "that lake whose gloomy shore Skylark never warbles o'er," *i.e.*, Glendalough in the County Wicklow. There are many such legends in which the absence of certain animals from particular localities or districts is insisted on, but the experience of naturalists has shown that such statements, however time-honoured they may be, are not always to be relied on. Mr. Dyer has collected some curious superstitions and odd notions concerning animals, chiefly in connection with weather-prophecy, death-omens, and the ill-luck said to attend the killing them, but he has by no means exhausted all that might be said on what may be termed "the Folk-lore of Zoology." Under this title some years ago, Mr. E. R. Alston contributed a series of articles to this Journal,[*] to which Mr. Dyer would have done well to refer, since they contain much that, in a collection like the present, might have been appropriately quoted.

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* See Ellis's 'Specimens of the Early English Poets,' vol. ii., p. 356.

Moore's Columbarium, or the Pigeon House; being an Introduction to a Natural History of Tame Pigeons. London, 1735. 8vo. Reprinted by W. B. TEGETMEIER. 'The Field' Office, 346, Strand. 1879. 8vo.

THE 'Columbarium' of John Moore, the first English work on the varieties of domestic Pigeon, is so exceedingly scarce that it is doubtful whether more than one copy exists besides those in the Library of the British Museum. The work is of considerable interest to naturalists, as showing the exact condition of the varieties at the time of its publication, and the amountof alteration effected by careful selection for one hundred and fifty generations since.

Mr. Tegetmeier has just published a *verbatim et literatim* reprint, which he has prefaced with an introduction containing an interesting notice of Moore's other works, allusions made to him by Pope and other contemporary writers; and he shows the importance attached to the work by tracing three out of the four copies in the British Museum to the libraries of George III., Sir Joseph Banks, and Sir Hans Sloane.

It will be recollected that a few years ago Mr. Tegetmeier published a reprint of Boddaert's scarce 'Table des Planches Enluminées d'Histoire Naturelle,' only two copies of which were known to exist in this country; and we understand it is his intention to reproduce in the same way, from time to time, such other works as from their rarity and utility are of interest and value to naturalists, and yet at present are beyond their reach. Such a "series," we feel sure, cannot fail to prove acceptable to those who, while prosecuting their own researches in Zoology, set a proper value on the labours of worthy predecessors.

[†] See 'Zoologist,' 1867, pp. 881, 921, 976, 1005; and 1868, pp. 1171, 1109.

CORRECTION OF ERROR.—In the review of 'The Fenland, Past and Present,' given in our last number, at p. 75, line 14, for "Swinesland" read "Swineshead."